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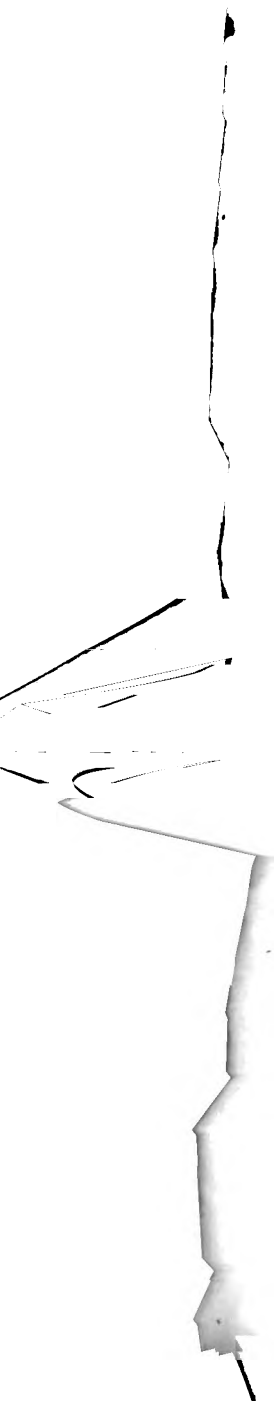
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AMERICAN JOURNAL OF PHARMACY.

PUBLISHED BY AUTHORITY OF THE

PHILADELPHIA COLLEGE OF PHARMACY.

EDITED BY

JOHN M. MAISCH.

PUBLISHING COMMITTEE FOR 1876:

HENRY N. RITTENHOUSE,
JAMES T. SHINN,

THOMAS S. WIEGAND,
CHARLES BULLOCK,

AND THE EDITOR.

VOLUME XLVIII.
FOURTH SERIES, VOL. VI.

PHILADELPHIA:
MERRIHEW & SON, PRINTERS.
1876.

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THE AMERICAN JOURNAL OF PHARMACY.

JANUARY, 1876.

THE ALKALOIDS OF VERATRUM VIRIDE AND ALBUM—HISTORY, PREPARATION AND RECOVERY FROM COMPLEX MIXTURES AND THE BLOOD.

BY THEO. G. WORMLEY, M. D.

Chemical History.—Much discrepancy has existed among observers in regard to the exact nature of the active principle or principles of *Veratrum Viride*.

Thus, in 1838, Mr. H. Worthington announced that he had obtained from the plant "an alkaloid substance identical with veratria."

And, in 1857, Mr. J. G. Richardson, after an elaborate examination of the subject, concluded that "not only in its physical characters, but also in its chemical actions, the alkaloid of *veratrum viride* is identical with veratria of the *Veratrum sabadilla*." (*Amer. Journ. Phar.*, 1857, p. 209.)

In 1862, Mr. G. J. Scattergood announced that in addition to veratrin, the plant contained another substance, similar in nature to that alkaloid, but insoluble in ether, and also a third substance, a resin to which the sedative action of the drug was chiefly due. (*Ibid.*, 1863, p. 74.)

So also, in 1864, Prof. S. R. Percy extracted from the plant an alkaloid, which he concluded had all the chemical properties of veratrin, from *Veratrum sabadilla*. (Prize Essay.)

On the other hand, in 1865, Mr. Chas. Bullock claimed (*Amer. Journ. Phar.*, 1865, p. 321,) that the alkaloid in question was not identical with veratria, as it did not respond to the sulphuric and hydrochloric acid tests for that alkaloid; that the resin of Scattergood owed its activity to the presence of another alkaloid; and that these two principles exhibited the same reactions with the mineral acids and with liquid reagents, the chief difference being in their fusing points and in that one was soluble while the other was insoluble in ether. Prof. Geo. B. Wood named these substances respectively *veratroidia* and *viridia*.

In 1872, Dr. Peugnet (*Med. Rec.*, May, 1872, p. 121) also concluded that the veratroida of Bullock was distinct from veratria, as it did not respond to the sulphuric acid test for that base, although it did to Trapp's test (hydrochloric acid). And he was the first to announce that Bullock's viridia was identical with Simon's jervia of *Veratrum album*.

So, in 1874, Mr. C. L. Mitchell (*Proc. Am. Phar. Asso.*, 1874, p. 436,) obtained from this plant a base readily soluble in ether, which failed to fully respond both to the sulphuric and hydrochloric acid tests for veratria, and he therefore concluded that it was a distinct principle. Mr. Mitchell confirmed Dr. Peugnet's announcement of the identity of viridia and jervia.

Much the same confusion has existed in regard to the principal alkaloid of *Veratrum album*. Thus, in 1819, Pelletier and Caventou announced that the alkaloid of the plant was identical with veratria from *sabadilla* seeds; whilst, in 1872, Dr. Peugnet claimed that the alkaloid was not veratria, but identical with veratroidia of *Veratrum viride*; whilst still later, Mr. C. L. Mitchell claimed that it differed from both alkaloids, and proposed for it the name *veratralbia*.

The question as to the identity, or otherwise, of these principles being a matter of considerable importance, especially in toxicological examinations, we have given the subject very careful study, and, as the result of repeated experiments, we find that *both veratrum viride and veratrum album contain an alkaloid, which, when pure, in its behavior with the mineral acids and with liquid precipitants, fully responds to all the reactions of veratria or veratrin.*

Thus in the solid state, under the action of concentrated sulphuric acid, the alkaloid from both plants assumes a yellow color, and slowly dissolves to a yellow or reddish-yellow solution, which after a time becomes orange red and finally deep crimson with a purplish hue. If the mixture be gently warmed, the crimson coloration manifests itself at once.

If the alkaloid is impure, at least, if it contains an apparently oily matter which adheres most tenaciously, it will strike a more or less red color with sulphuric acid and quickly dissolve to a reddish-yellow solution, which after a time acquires a more or less brownish-red color, but fails to assume the crimson coloration of the pure alkaloid. The presence of pure jervia in very minute quantity does not appear to materially interfere with the normal reaction of the alkaloid with this acid.

The claims, as we have already seen, that the alkaloid in question from the three different veratrums was not the same, has been based chiefly upon the behavior of the product obtained with concentrated sulphuric acid; and also in part upon its behavior with hydrochloric acid.

It may here be stated, that several years since we received of Dr. Percy, of New York, a small sample of the alkaloid prepared by Mr. Scattergood, of Philadelphia, from *veratrum viride*, which yields color reactions with sulphuric and hydrochloric acids, identical with those of pure veratria, when compared side by side with that alkaloid.

It has also been claimed that "veratralbia" differed from "veratria and veratroidia," in that its solution failed to yield a precipitate with chloride of platinum. But we find that solutions of each of the so-called different principles, when of the same strength and under like conditions, if not too dilute, will yield precipitates that in no way can be distinguished.

Preparation of the Alkaloids:—For the preparation of the alkaloids of *veratrum viride*, a fluid extract of the root, prepared by Sharp & Dohme, of Baltimore, was employed throughout our examinations. After a number of experiments the following method was adopted:

The fluid extract, acidulated with acetic acid in the proportion of fifteen minims per fluidounce, is added with constant stirring, to eight volumes of pure water,—the mixture allowed to stand 24 hours, or at least until the precipitate has completely subsided, and the liquid then filtered. The clear, yellowish filtrate is concentrated on a water-bath to something less than, or even to one half, the volume of the fluid extract employed, when it is allowed to cool and again filtered.

The filtrate thus obtained is treated with slight excess of carbonate of sodium, which will throw down a voluminous precipitate of the mixed alkaloids. This mixture is agitated with about its own volume of *ether*, which will readily take up the precipitate. After decantation of the ether, the alkaline fluid is washed with a small quantity of fresh ether, which in its turn is decanted.

Although *jervia* in its pure state, when precipitated, is only very sparingly soluble in ether, yet under the above conditions, it is very freely soluble in this liquid, 100 fluidgrains of the liquid readily taking up between two and three grains of the mixed alkaloids. In its crystalline state, the alkaloid appears to be wholly insoluble in this menstruum.

The ether employed in most of the present examinations was of sp. gr. 0.725.

The ether employed for the above extractions, is allowed to evaporate, small portions at a time, in a rather deep, thin glass capsule, and the resulting residue dried in a water-oven.

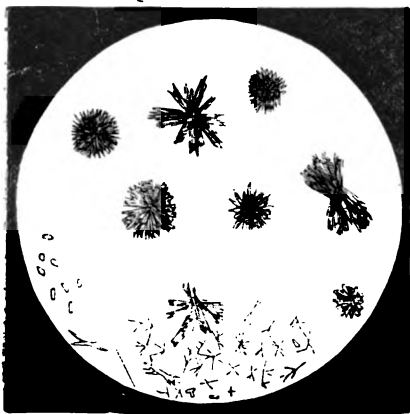


FIG. 1. JERVIA, FROM ETHERIAL SOLUTION. 30 DIAM.

Fig. 1. About two grains or something more of residue will be obtained for each fluid ounce of the fluid extracts employed.

For the separation of the alkaloids, the dried residue is treated with a little water strongly acidulated with hydrochloric acid (1:10), which will readily dissolve the *veratria*, whilst the *jervia* will be converted into the insoluble chloride. The quantity of acidulated water thus employed may be in the proportion of about a fluid drachm for every two grains of residue.

This mixture is transferred to a small, moistened filter, and, if necessary, the filtrate returned to the capsule until the whole of the insoluble matter is transferred to the filter, which is finally washed with a little acidulated water, and reserved for the recovery of the *jervia*.

The alkaloid in the *filtrate* may be further purified by washing the acid solution with ether, precipitating by sodium carbonate, and then either taking up the precipitate by ether or collecting it on a filter and washing, these operations being repeated, if necessary. On precipitating with sodium carbonate, a notable quantity of the alkaloid remains in solution, and may be recovered in a quite pure state, by extracting the

The outer or upper portion of the residue thus obtained, will consist chiefly of the *veratria*, in the form of a transparent, more or less yellowish, vitreous mass, in which, under the microscope, may be found some scattered crystals of *jervia*: in drying, this portion of the deposit generally separates, in part at least, from the sides of the capsule, in the form of transparent scales. The central or inner portion of the deposit will consist chiefly of the *jervia*, in the form

filtrate with ether. In its pure state, as left by ether and pulverized, the alkaloid forms a pure white, sparkling powder.

For the recovery of the *jervia*, left on the filter in the form of chloride, the deposit, being first pulverized, is boiled for some time, with a solution of carbonate of sodium, the mixture transferred to a filter, and the residue washed with a little water. The washed residue is treated on the filter with a little water strongly acidulated with acetic acid, by which the liberated alkaloid will be dissolved. The filtrate thus obtained will usually be more or less turbid; but by returning it to the filter, it may be obtained clear.

The *jervia* is now thrown down from the filtrate by slight excess of carbonate of sodium, and the precipitate extracted by agitating the mixture with *chloroform*, which on evaporation will leave the alkaloid in the form of a hard, transparent, amorphous deposit. On moistening this residue with a few drops of water, containing a drop or two of alcohol, it will quickly be converted into a white mass of groups of crystals of the pure alkaloid.

A portion of both alkaloids is retained by the resinous matter separated from the original aqueous mixture of the fluid extract, and may be recovered by boiling the powdered mass with water strongly acidulated with acetic acid.

The alkaloids from *veratrum album* were obtained by extracting the powdered root with water containing acetic acid, treating the concentrated solution with carbonate of sodium, and taking up the precipitate by ether, in the manner already described. The ether extract of the mixed alkaloids left the *jervia* in the same crystalline form as obtained from *veratrum viride*.

Reactions of Jervia:—*Sulphuric acid* causes pure *jervia* to assume a yellow color, and slowly dissolves it to a yellow or faintly reddish-yellow solution, which after some minutes acquires a beautiful bright green color. A very minute quantity of the alkaloid will exhibit this coloration. After a few hours, the green color thus produced disappears, and a dirty white or brownish precipitate separates.

This acid produces similar results with the chloride, sulphate, and acetate of the alkaloid, when in the solid state; but it dissolves the nitrate with the production of an orange-red color, which is permanent for at least some hours.

Nitric acid quickly dissolves the alkaloid to a colorless solution, which after a time acquires a more or less rose or pinkish hue.

Hydrochloric acid fails to produce any marked coloration or to dissolve the pure alkaloid, immediately converting it into the chloride, which is insoluble in the presence of the free acid, although somewhat soluble in pure water.

The foregoing mineral acids occasion the following reactions with one grain of a 1-100th solution of the alkaloid, in the form of acetate :

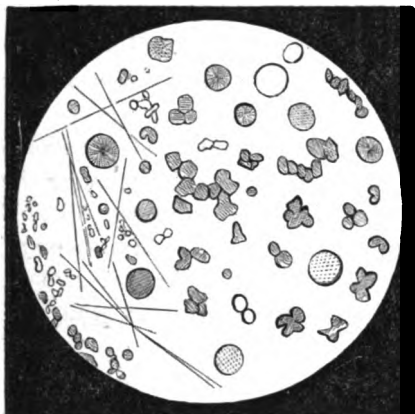


FIG. 1. 1-100 GRAIN JERVIA + SULPHURIC ACID. 75 DIAM.

this acid is quite peculiar to this alkaloid.

2. *Nitric acid* of sp. gr. 1.20, occasions an immediate, copious precipitate, which in a little time becomes converted into nodular masses, some of which are spinated.

If the jervia solution contains excess of free acetic acid, especially if a minute drop of this acid be added after the reagents, the precipitate soon becomes converted into a mass of crystals of the forms illustrated in Fig. 3.

*Nitrate of Potassium** produces with a neutral (1-100th) solution

1. *Sulphuric acid*, dilute (1:5), produces an immediate turbidity, and in a few moments a dense dull-white amorphous precipitate, which soon becomes more or less granular. After a time, the deposit consists of more or less circular, nodular masses, and especially along the margin of the deposit, fine groups of long, very delicate crystalline needles. Fig. 2. These circular masses generally appear, under the microscope, of a brownish color. The reaction of

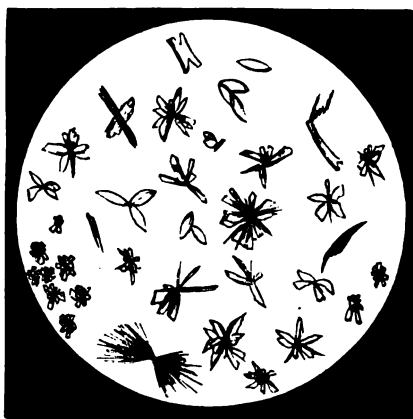


FIG. 3. 1-100 GRAIN JERVIA + NITRIC ACID. 75 DIAM.

* This reagent has been proposed as a valuable test for the alkaloid by Mr. Chas. Bullock, in a paper in the October number of this Journal, which came to hand about the time we had completed our examinations.

of the alkaloid, an immediate turbidity, and after a little time, a quite good deposit of granules and crystalline masses. In the presence of free acetic acid, this reagent produces much the same results as free nitric acid.

3. *Hydrochloric acid* produces an immediate, copious, dull-white amorphous precipitate, which becomes more or less granular.

4. *Bromine in bromohydric acid* throws down from solutions of the alkaloid, a dense, curdy yellow precipitate, which is readily soluble in alcohol. On spontaneous evaporation of the alcoholic liquid, the deposit is left in the granular form.

5. *Platinic chloride* produces a deep yellow precipitate, which becomes lighter in color, and more or less granular.

6. *Auric chloride* occasions a light yellow, curdy precipitate.

Jervia is also precipitated by other liquid reagents, but the reaction, like the last three mentioned, are common to a large class of substances.

Recovery of the Alkaloids from complex mixtures.—The following experiments were made in order to determine in how far the alkaloids could be individually recovered from complex mixtures :

Exp. 1. *Cat.*—Two drachms of the fluid extract of *veratrum viride* were administered to a half-grown cat. The animal was immediately rendered prostrate, and was dead in about *one minute* after the administration. As a quantity of the fluid extract escaped from the mouth of the animal, we have doubts if more than one drachm reached the stomach.

The Stomach.—The contents of the stomach, with the cut-up tissue of the organ, were strongly acidulated with acetic acid, the whole made into a liquid mass with water containing its own volume of alcohol, and the mixture digested at a moderate heat for half an hour. The liquid was then strained, concentrated, again strained, and finally reduced to a small volume and filtered.

This filtrate was treated with slight excess of carbonate of sodium, and the mixture extracted with ether. The deposit left on evaporating the ether, contained a large number of groups of crystals of jervia, and the margin was of a resinous character, and also contained small crystals.

The residue was treated with a little water containing hydrochloric acid, and the alkaloids separated in the manner already described, the chloride of jervia being collected in a small filter.

The second ether extract of the *veratria* furnished the alkaloid in a sufficiently pure state to yield very satisfactory results with the sulphuric acid test.

The final residue of the *jervia*, consisted of a mass of crystals of the alkaloid.

The Blood.—Seven drachms of blood were recovered from this animal. This fluid was treated with six drops acetic acid, its own volume of alcohol and a somewhat larger quantity of water, and the whole violently agitated for some minutes in a bottle.

The mixture, transferred to a dish, was digested at a moderate heat, then strained, and the solids washed. The strained liquid was concentrated, again strained, and these operations repeated until the liquid was reduced to about half a fluidounce, when it was filtered.

The filtrate, after addition of carbonate sodium, was extracted with about an equal volume of ether, and this liquid evaporated, small portions at a time, in a small capsule. A careful examination of the residue left by the ether, failed to discover any crystals. But on treating the residue with a few drops of diluted alcohol, and gently evaporating the liquid, a number of small crystals and crystalline groups, of the forms shown in the lower portion of Fig. 1, were found in the resinous or outer portion of the deposit.

The central portion of the deposit was now dissolved by treating it with a very small quantity of water acidulated with acetic acid,—care being taken not to disturb the resinous portion of the deposit. For detaching and effecting solution of the deposit in this operation, a small feather, or, better still, a small flattened pencil of rubber in a glass handle, will be found useful. The quantity of the alkaloids present under these conditions, is too minute to permit of separation in the manner previously described. But as the *jervia* is rather readily taken up by the acidulated water, whilst the *veratria*, as deposited, is but slowly acted upon by the liquid—they may in very great part be thus separated.

The liquid, which now contained the greater part of any *jervia* present, was decanted, treated with a little carbonate sodium, and the mixture extracted with ether, which on evaporation left an amorphous residue. On moistening this with a few drops of diluted alcohol, and evaporating the liquid, the residue, distributed over a space nearly an inch in diameter, was found to consist of a mass of small crystals of *jervia*, of the forms and as thickly distributed as shown in Fig. 4.



FIG. 4. JERVIA, FROM BLOOD OF CAT.
 75 DIAM.

On further purifying the resinous matter left in the capsule, it furnished, under the action of concentrated sulphuric acid, very good evidence of the presence of *veratria*.

Exp. 2. *Dog.*—Between two and three drachms of the fluid extract were administered to a dog, weighing about thirty-five pounds. The animal was soon seized with violent vomiting and retching, succeeded by purging and discharge of urine. Two hours after the admin-

istration, there still being very active symptoms, the animal was killed by a blow upon the head. The *stomach* of this animal was not examined.

The Blood.—Three ounces of blood carefully taken from the femoral artery of this animal, were acidulated with acetic acid, violently agitated with a mixture of water and alcohol, and the mixture treated in the same manner as the blood from the cat,—the final solution being reduced to 375 fluidgrains.

This solution, after addition of carbonate sodium, was extracted with 200 fluidgrains of ether, and finally washed with a little of that liquid.

Ten fluidgrains of the ether first employed, when allowed to evaporate, left a residue containing a large number of minute crystals of jervia. On evaporation of the whole of the ether employed, another crop of crystals was obtained, and the margin of the residue was of a resinous character.

On separating the different portions of the residue by acidulated water and treatment in the manner already described, perfectly satisfactory evidence of the presence of *both alkaloids* was obtained.

The quantity of *veratria* recovered in this instance seemed to be greater than in the case of the cat, whilst that of the *jervia* seemed to be less.

Of all the alkaloids, there is none, according to our experience, so readily recovered in its crystalline state from the blood, when carried

there by absorption, as jervia. We have elsewhere (Micro chemistry of poisons) cited some cases in which we recovered veratria from the blood of animals killed with the commercial alkaloid.

Columbus, O., Oct. 20th, 1875.

THE RELATIONS OF PHARMACISTS TO PHYSICIANS AND NOSTRUMS.

BY FREDERICK HOFFMANN, PH. D.

It is with much reluctance that I have accepted an invitation to prepare a brief rejoinder to recent articles in some medical journals on the mutual relation of physicians and pharmacists, and on the nostrum traffic, which more or less bear the traditional stamp of disregard or misconception of the real relations existing between these two complementary professions at this time, when the rapid strides in the advance, as well as in the application, of their constituent sciences are more and more shaping their true scope and sphere in the health service.

On the surface of these articles there are three main points of dispute, namely: the sale of nostrums, the alleged prescribing by pharmacists, and "the propriety for physicians of *sending* prescriptions."

1. The *nostrum traffic* has attained such dimensions that, according to reliable statistics,* two-thirds of the total quantity of medicines annually consumed in the United States, are dispensed in the form of nostrums. When we inquire for the causes of this remarkable fact, in a country which can boast of one regular practitioner of medicine to every 600 inhabitants, looking aside from those thinly-settled regions whose population is scattered widely apart, where medical aid cannot be had readily and at all seasons of the year, and where for want of recognized family medicines or generally approved formulas for household remedies, the people as yet have recourse largely to nostrums; there are three alternatives obvious: first, that a large number of the nostrums really possess so much merit and have secured so much credit, as to offer, in all ordinary cases, a satisfactory substitute for average medical skill, as it can be obtained at present; or, secondly, that this latter is largely regarded as so far inferior or disproportionate in price to the actual or fancied benefit derived from nostrums, that experience and fact have secured for the "infallible" cure-all a greater

* "Boston Medical and Surgical Journal," August, 1874; and "Amer. Journ. Pharm.," September, 1874, p. 445.

confidence than is felt in the fallible doctor; or, thirdly, that the public, who annually spend so many millions of dollars more for nostrums than for doctors, must greatly lack in common sense and judgment.

The pharmacist, as far as the nostrum traffic is concerned, is but a merchant; he occupies a neutral ground, and cannot, if he would, regulate it. His personal inclination or preference has just as little to do with the merits or demerits of nostrums as it has with those of the doctor; nor have pharmacists, in general, any influence upon the choice of the public between either of them, although their preferences as well as material interests are certainly in favor of the latter; and, moreover, they suffer by the alleged degeneration of their profession into a mere trade, much more than the physicians do, or than is generally known. It is not in their power, however, to change the law of demand and supply, nor can this be accomplished by statutes, forbidding or endeavoring to control the sale and use of nostrums, or the choice of remedies, doctors, or methods of treatment, by the people, any more than it is possible to protect the community in that way from the evidently large numbers of insufficiently educated, incompetent "and unskilled, yet regularly-graduated, physicians,"* nor restrain these from experimenting on the health and life of the afflicted, who, in many cases, have no chance to obtain an approximately correct estimate of the qualification of the physician or to discriminate between the educated one and the pretender, and, still less, have any means of detecting incompetency and malpractice until, perhaps, it is too late, and a valuable life has been sacrificed.†

So long as medicines in the form of nostrums and specialties are bought and used, it is, no doubt, safer that they should at least pass through the hands of a trade which is competent to exercise a kind of control over the character of that particular class of ready-made medicines. As long as pharmacy can uphold its present scope, its legitimate business should continue to embrace the dispensation to the public of all those products of nature, manufacture or art, which serve as remedies or are used for sanitary or domestic application, no matter what so-called school of medicine employs them, or in what shape or preparation they

* Dr. H. C. Wood, Jr., "Medical Education in the United States," in "Lippincott's Magazine," December, 1875, p. 703; and "Philadelphia Medical Times," January 23d, 1875.

† "New York Daily Times," July 17th, 1875.

are called for and retailed. If pharmacists should drop the nostrum traffic, as unwisely insisted upon by some medical journals, or should deliberately deliver to other branches of trade the sale of natural or artificial mineral waters, the keeping of homœopathic pellets or other articles which by long usage, have been associated with the drug trade as it has developed, outside of pharmacy proper, and, perhaps, against the preference and interests of the pharmacist, the result would certainly not be a decrease in the demand and use of nostrums, mineral waters, sugar pellets, fancy medicines, including elixirs, tonics, medicated candies, etc.;—their sale would only pass into less qualified hands. The nostrums and kindred specialties would pass from the show-windows and shelves of the drug stores to those of the grocer, fancy-dealer, confectionery store, etc., and would there, but with greater *éclat*, bear evidence of the fact how much more confidence a large part of the American people place in their familiar cure-all nostrums than in the skill of the average physician.

Unbecoming and discreditable, as is the association of the nostrum trade with pharmacy, yet, generally speaking, the choice of the smaller evil from the two alternatives forced upon the pharmacist, justifies him, in the interest of the public, in retaining, and, as far as possible, controlling the trade in medicines, in whatever legitimate form they may appear in the market. The correctness of this view is sustained by the fact, that it is practically applied in countries whose sanitary regulations are very strict and are regarded as models of wise and adequate legislation. With the increase of travel, the American quack medicines have followed the large annual exodus of our substantial classes to Europe, and many of our popular nostrums, in consequence of the great demand, have been introduced on the continent of Europe and in Germany, where medicines are not admitted to patent-rights; but no sooner had the demand called forth their importation, than the Imperial government promptly enacted a statute, confining the exclusive trade in this kind of "Yankee notions" to the apothecaries, in order to submit them, as far as practicable, to the control of a competent and critical profession.

For the present, therefore, it may be safest for pharmacy to embrace in its scope every legitimate system and mode of dispensing and retailing medicines, while the attainments and character of the pharmacist should ever remain a criterion and a safeguard both to the public and the physician, and should prevent him from countenancing imposture

or fraud. On the other hand, as already stated, it should fairly be taken into consideration that the nostrum-traffic has been forced upon him, and that he, as a rule, takes an adverse position, only supplying the demand; as also, that the pharmacist has no right to influence the choice of the customer between the physician—allopath or homœopath—or the familiar nostrum, unless called upon for his opinion.

Moreover, every well-informed person knows that the nostrum traffic cannot effectually be restrained merely by the favor or disfavor of pharmacists any more than by that of physicians, and that the use of nostrums is by no means confined to the non-educated portion of the community, but that it prevails largely among the wealthy classes, both at home and abroad; as also, that among the patrons of this class of medicine, as the prescription file of the drug stores throughout the country will testify, may be numbered not a few physicians of good standing.

But when we come to the bottom of the question, and inquire without bias for the primary cause of the origin and great success of the nostrums in our country, we cannot but lay a very great part of it at the door of the medical profession at large, or, perhaps, attribute it, ultimately, to the want of adequate laws for the regulation of the methods and standard of medical education and the requisite qualification for admission to the practice of medicine by physicians. The fact is that nostrums, to a very large extent, have supplied an actual want, in consequence of lack of trustworthy medical aid and of confidence, on the part of the community, in the qualification of a large number of physicians. This want has opened many a door to nostrums in preference to the doctor, and has contributed much to raise this traffic to its present extent, almost exactly in proportion with the increase in numbers and the decrease in qualification and public trust in the average doctors, a large portion of whom "have attained and still acquire their training and engage in practice under the absurd notion that a medical education can be acquired in two winters, and in many cases, even without a preliminary grammar school education."* It is therefore no wonder that in the choice between the cure-all nostrums, or the pellet and drops of the homœopath, or a multitude of unqualified practitioners, not to speak of the pretenders and impostors, the public frequently give preference or a first trial to the harmless sugar pellet or the familiar nostrum, and that two-thirds of the entire amount of drugs and medicines annually consumed in our country, are bought and used in the form of nostrums.

*Dr. H. C. Wood, Jr., "Lippincott's Magazine," December, 1875, p. 705.

Nor is it strange that among the large class of educated, conscientious and high-minded physicians, who have more or less to suffer * by the iniquities of unworthy competitors, and who keenly feel the disgrace which these reflect upon the profession at large as well as among the public, the demand for adequate legislation † is increasing, in order "to check the unbridled license of the lower class of practitioners, and to protect the community against the disastrous activity of a multitude of untrained and reckless, yet regularly graduated, practitioners." ‡

That the public apply to the pharmacist for their supply of medicines of their own selection, is but an evidence of the superior trust which he possesses in the general regard of the people, who are well aware of the fact that American pharmacy, by its own exertion and energy, has, of late, raised its status much nearer to the European standard. Nor is that all; it is still advancing quietly and without any presumption, indeed, but with such success that empiricism and incompetency, so largely prevailing, and, as generally admitted, on the increase, among physicians, are more and more falling into oblivion among pharmacists.

Under these circumstances, medical writers should exercise due regard and discretion in criticising pharmacists in their legitimate attempt to check and relieve an evil, whose magnitude is largely the consequence of the shortcomings of a great part of the physicians of the land. The present move on the part of pharmacists to counteract the use of nostrums, by instructing the people, by means of an annual almanac, § in regard to their composition and danger is, perhaps, the wisest method. It has been successful in other countries, and is, at least, worth a trial here; while in regard to the before-mentioned causes of the success which the nostrums have attained in our country, as substitutes for medical aid, it is certainly the most discreet and forbearing means within the reach of the pharmacists. They, of course, are well aware of the incompleteness of their effort, as they cannot expect a sweeping change so long as the shortcomings and disqualification of so large a portion of practitioners continue to

* Dr. Wm. T. Edgar, President's Address before the Medical Editors' Association. "St. Louis Medical and Surgical Journal," May, 1875, p. 231.

† Dr. Stephen Smith. "Public Health Service and Medical Education," an address before the American Public Health Association. "New York Daily Times," November 13th, 1874.

‡ Dr. H. C. Wood, Jr., "Lippincott's Magazine," December, 1875, p. 711.

§ The Popular Health Almanac, edited by Fred. Hoffmann.

diminish confidence in the unexceptional qualification of the medical profession at large, and tend to drive the public to other means of relief, and among them, especially, to nostrums.

2. The charge upon pharmacists of the alleged practice of prescribing, or advising and dispensing medicines on their own account and responsibility, when called upon to do so, is one which medical men occasionally like to indulge in, and in which they draw largely on their own imagination, and put all the real or fancied facts deliberately to one side. The fact is, that the choice of the methods or agents to be employed in the maintenance or restoration of health, and the inquiry for, as well as the imparting of advice as to remedies and their application or use, as well as the sale of unobjectionable commercial drugs and medicines, with the exception of a few whose sale is restricted for their poisonous character, by State or local laws, and the compounding of physicians' prescriptions, is entirely optional to every individual in this land, as well as, more or less so, elsewhere. This principle, right or wrong, has lately asserted its validity in regard to the practice of medicine, even in Germany,* notwithstanding its rigid statutes and thoroughly educated body of physicians; it, unfortunately, leaves a wide and precarious range to license, which, however, under the present constitutional privileges of every individual, evidently cannot effectually be met other wise than by the jurisdiction of the penal code in the courts, as the ultimate safeguard and recourse in cases of injury by malpractice. Beyond this alternative and the fundamental exigency in this country, to raise and establish by statutes, and subsequently to maintain, the standard of education and qualification in the professions, no other tribunal can be had for the present, unless that moral one which culminates in a proper and sound sense of responsibility, character and honor in the individual, and which pharmacists, not less than the physicians, individually as well as a class, should possess and deserve *par excellence*.

Far from sanctioning or countenancing imposition or licence by unqualified or unprincipled persons, inside or outside the professions, although they, to a very large extent, are admitted by the laws and customs of the land, it may, in regard to pharmacists, be but proper to take into consideration, on the other hand, how much good they do, in the way of preventing misapplication or omission, and how many a

* "American Journal of Pharmacy," July, 1874, p. 321.

valuable life they may save, by their intelligent and conscientious action, and by wise counsel in impressing upon the minds of their customers or the afflicted the advantage or necessity of abstaining from experiments, at least with domestic remedies, sugar pellets or nostrums, and of resorting in time to medical aid.

The truth is that, in this respect, no complaint on the part of the community against the pharmacists appears to be on record; and it may safely be said that American pharmacy, notwithstanding its many wants, especially in regard to the general culture in the individual, which it has in common with the other professions, evidently enjoys, at present, to a large extent, the public confidence, and meets all reasonable expectations to general satisfaction. Whenever there has been any just demand, the profession has shown the spirit and energy to redress and improve any shortcoming, while in its schools it has continually been raising the standard of education and qualification, although they, perhaps, may have, in time, to face the same danger which so deplorably has lowered the status of qualification in so large a portion of American physicians, arising from the excessive and reckless multiplication of rival schools, many of which are said to confer the degree of M. D. indiscriminately "on the veriest boor, almost without expense, and upon an examination which is little or nothing more than a farce," and in this way "annually to let loose upon the community a multitude of doctors who are totally unfit for the momentous duties with which they, by such a diploma, are legally entrusted."*

Under such circumstances, where the fundamental requisites for confidence and reliance in the physician are so much and so widely wanting, in a great number even of regular practitioners throughout the land, and where evils are so openly known to exist and call for reform, evils which are of no small magnitude to the profession, but of infinitely greater consequence to the community, the advancing of imputations, like the above-mentioned one, on the part of medical journals, is at least untimely and impolitic, as it is also uncalled for, and recalls forcibly the application of the old adage: "Those who live in glass houses should not throw stones."

3. "*We might suggest the propriety of sending our prescriptions to such pharmacists as do not vend patent medicines.*" Although none more than

*Dr. H. C. Wood, Jr., in "Lippincott's Magazine," December, 1875, pp. 707 708 and 709.

pharmacists would hail the day when, in consequence of the restored universal trust in the physician, doctors' prescriptions and the exclusive demand for legitimate medicines would take the place of every sale of a nostrum, and the latter pass into oblivion, yet they cannot admit the logic as construed and applied in the above assertion, cited from an editorial in the New York "Medical Record:"* they share with the majority of well-informed and accomplished physicians and the intelligent part of the community in the opinion that the time has passed by, when reliable and competent pharmacists were at a premium, and that at present the large body of educated pharmacists to be found throughout the country, no matter if they sell nostrums or not, are both qualified and trustworthy in their business, however it may be designated by some doctors "as a profession or a trade."† If physicians cannot make this discrimination, the public can, and will more and more act on their own judgment in the choice of a pharmacist, just as in that of a doctor. People of culture cannot but feel it an impropriety in a physician, unless in exceptional cases, to direct or dictate to a patient where to go in order to get his prescription compounded, and such insinuation would reveal a want either of tact or of good sense in the physician, and would possibly suggest the traditional suspicion of a special interest of the latter in the profits which he confers upon a pharmacist.‡

In leaving this unpleasant subject, which it is unwarrantable for medical writers to advance as a menace,§ and in relation to an attempt on the part of pharmacists as to the best and most efficient methods in dealing with the nostrum traffic, it is proper to state, as expressing the sentiment of the pharmaceutical profession and to a large extent that of the intelligent public too, that pharmacists are fully justified in sharply repelling any such unbecoming insinuation, from whatever side it may come, whether by caprice or by want of respect, or under the obsolete notion that physicians have the prerogative of exercising a tutelage over the practice of pharmacy, a profession which, in the United States, too, has reached its majority, and become competent to take care of its own affairs and to stand on its own merits.

When we balance the present status of medicine and pharmacy in

* October, 1875, p. 729.

† New York "Medical Record," October, 1875, p. 682.

‡ "American Journal of Pharmacy," September, 1874, p. 444.

§ New York "Medical Record," October, 1875, p. 729.

our land, the latter need not shrink before a critical but equitable and just comparison, both in its accomplishments and its share of application and usefulness in the health service. Both professions present a wide and constantly increasing sphere for scientific acquirement and practical skill, requiring for *adequate* qualification, a superior preliminary training of the intellect, and a large amount of proficiency and knowledge, while both have in common their measure of deficiencies and wants, and their drawbacks. When thoughtful and high-minded men are conscious of these, and keenly feel shortcomings and abuses, and call for improvement and reform, they should, when confronting so great evils, bear with real or fancied or overrated minor wants, avoid and discountenance unavailing antagonism, and gain and cherish strength by advancing friendly and auspicious mutual relations between physician and pharmacist. They certainly will meet, in their honest and well-directed efforts, with due appreciation, encouragement and support. In consideration, however, of the privileges equally secured by our national constitution to every individual, and conceding a wide scope for licence, all that can be aimed at and realized, in order to remedy and counteract the consequences, may be the legislative enactment and subsequent maintenance of an adequate standard of qualification in every individual inside of the professions.

Upon the relations between medicine and pharmacy well informed men need, on this occasion, no further comment, while the personal relations between physician and pharmacist invariably rest on the level of education, culture and character in the individual. For shortcomings in this respect the professions, of course, cannot be held responsible.

RESEARCHES UPON BUCHU.

BY PROF. E. S. WAYNE.

Buchu from the examinations of previous analysts has been shown to contain an ethereal oil in small quantity, and also that this oil contained a camphor which could be separated from it by exposure to cold. No other proximate principle peculiar to the drug has been proven to exist in it.

In handling large quantities of this drug in a manufacturing way, I have noticed some facts and peculiarities not mentioned by others, and find that the essential oil above mentioned, is not always so simple a body as stated.

Some time since, having occasion to distill off the remaining alcohol from a partially exhausted lot of buchu, I obtained in the last runnings of the still a quantity of oil of buchu, in all, about twelve ounces, and, upon examining it in various ways, I found that upon treatment with strong liquor sodæ, nearly one-half of the oil dissolved to a clear solution; this solution was separated from the oil unacted upon, and then neutralized by hydrochloric acid, which caused the separation of a white solid crystalline mass; this was thrown into a beaker glass and washed with water, then dissolved in boiling water, and set aside for results. Upon examining the same some time afterwards, I found that the whole had assumed a highly crystalline state, was colorless, and resembled salicylic acid in form; and upon examining them further, found that they were in fact that acid, and gave all the reactions for that substance, and with ferric chloride gave the beautiful color reaction, a deep purplish red. I was very much astonished at the result of my examination, and read a paper upon the same at a college meeting some six months ago, and should have published the same then, but wished to verify the above by further experiments, and since then have made several examinations, but not with the same results.

My next experiment was to distill with water 20 pounds of buchu; (in all these experiments the short variety was used) the oil collected and treated with soda as in the former experiment. I found that the oil obtained from this lot did not dissolve, or lose the same volume that the former did, but that a part formed a clear solution, which, upon being separated and neutralized with hydrochloric acid, became milky turbid in appearance; this was set aside over night, and in the morning the same was found almost transparent, and filled with a mass of long needle-shaped crystals—these were separated by filtration, washed with cold water, and suffered to dry on the filter—they were tested in solution in water, with negative results, except with nit. silver and ferric chloride; that of the ferric chloride was very marked and decided; upon addition of this reagent to the colorless solution it caused an intense blueish black color even in very dilute solutions, as decided as that of salicylic acid with this reagent, but of a different color.

Failing in this experiment to obtain the same results as in the former, and thinking over the matter, thought that probably the alcohol might have caused some change in the former; a quantity of fluid extract of buchu, about six pints, was distilled with the addition of water. I obtained only a small quantity of oil, which, in every respect, gave the

same reactions as with that obtained by distilling the buchu with water. With this experiment the investigation was left at rest, until this Fall, when it was again taken up, and whilst engaged in it, Mr. Wm. M. Thompson, of W. H. Merrell & Co., brought me as curiosity a few crystals of a substance that he said was obtained in attempting to distill off the alcohol from a lot of buchu magma. I immediately recognized them as being the same substance I found in the two last experiments; and learning from him that the whole was just about the same as the mass that I had originally distilled, and found salicylic acid in the oil, I made a request of Messrs. W. H. Merrell & Co., through him, that the same be placed at my disposal, to which they kindly consented. I received a barrel about three-fourths full of the magma, and distilled it with water. I obtained from it a portion or all of the alcohol, and by continuing the distillation and cohobating the watery distillate obtained six gallons of a milky distillate, but only slight traces of oil floating upon it. This distillate was set aside over night, and upon examining the same in the morning, found there had formed nearly two inches deep upon the bottom of the vessel holding the liquid, a mass of long needle-shaped crystals, some an inch and a half long; the supernatant liquid was syphoned off, and the crystals then collected on a filter. These were tested as the former, and with ferric chloride gave the same dark bluish-black color. The water syphoned off also gave the same, and the alcohol distilled from the magma gave the same result. I obtained no oil to test for salicylic acid, and could not detect it in any of the distillates. From this lot of buchu I have obtained nearly three ounces of this crystalline body, in long needle-shaped colorless crystals, having an odor indicative of their origin, yet different. What it is, I am not yet able to say, but shall examine it more fully and report at some future time.

Buchu, from what has been shown, evidently contains some substance, that by its chemical change, will yield salicylic acid, and probably it is the crystalline body I have found in the three last experiments. This is sparingly soluble in water at ordinary temperatures, freely at the boiling-point; which solution upon cooling, becomes turbid from separation of oil drops, which afterwards turn to crystals soluble in alcohol and ether; and the aqueous solution with ferric chloride forms an intense, I may say, inky blue color, so intense as to render the solution opaque even in a test tube half an inch in diameter.

Nitrate of silver also occasions a precipitate of a purplish color, deeper than that of chloride silver, exposed to the action of light.

Cincinnati, Dec., 1875.

ON SOLUTIONS OF MOLYBDIC IN SULPHURIC ACID AS A
REAGENT FOR ORGANIC PRINCIPLES.*

BY HENRY S. WELLCOME, PH. G.

Dr. Regnald Southey, Physician to St. Bartholomew's Hospital, London, in his report for 1874, (vol. x, p. 303), announces, as a new test for opium, a solution of molybdic acid in sulphuric acid. The following is an abstract of his statement: "A new test for opium; a color test, at once so characteristic and intense, of such easy applicability and such extreme delicacy, that it needs only to be more generally known in order to be often employed; molybdic acid dissolved in pure sulphuric acid is the testfluid; a saturated, or, at all events, a strong solution should be made. The reaction is produced by morphia in opium, not by the meconic acid; the latter undergoes no change with the reagent; the former, in *minutest quantities*, at once furnishes *characteristic* reaction. The best mode of proceeding is to place a drop of the suspected fluid side by side with a drop of the test fluid, by means of a glass rod; at once, if morphia, or any of its salts, be present, a beautiful deep maroon color will be presented, when the fluids are brought in contact; the color changes after a while, becoming, first deep purple, and then gradually losing its red element, and becoming dark, and later, a brighter blue. In evidence of the minuteness of this test I may adduce the following facts: *The reaction is distinctly* obtained with a single drop of pharmacopœial *tinct. opii*, as also with the compound *tincture* of camphor.

"*The presence of a good deal of impurity, and of alien organic matter, does not interfere much with it.* Of this I feel *confident*, that the busy practitioner will *hail* this *new discovery*, which enables him to detect *laudanum* or *morphia* in the dregs of bottles, brought to him to test, and in fluids vomited, and to *swear to its presence with positive security*. I was enabled to detect the $\frac{1}{10}$ grain of morphia, as presented in the morphia lozenge of our pharmacopœia."

It is an error that *such tests* are published, especially for determining the presence of so important a principle and so common a poison as morphia, and with the commendation of one whose position should warrant authority and reliability. We should be sorry to learn of Dr. Southey's swearing to the presence of opium or morphia, his findings based upon this test alone, in a chemico-legal poison case, where a

* Read, December 7th, before the Monthly Meeting of the New York Alumni Association of the Philadelphia College of Pharmacy.

person's life or liberty was depending upon his testimony. The test is *not* characteristic ; there are many other organic bodies which yield the same color with the reagent, and the presence of other organic matter *does materially interfere* with the reaction, varying according to its character. He states that he was able to produce the reaction with a single drop of tinct. opii or tinct. opii camph., he could as well produce the same reaction with any other tincture, and even with pure alcohol ; but they give a bright purple color, changing to blue, and not the maroon, which is produced by pure morphia, and similar bodies.

Mr. Buckingham, in "American Journal of Pharmacy," 1873, p. 150, proposed a solution of molybdate of ammonium, eight grains, in sulphuric acid, two drachms, as a test for some organic bodies, giving a table, showing the changes of color produced by the most important alkaloids, and, while his results show that his experiments were conducted with care, yet he overlooked the fact that those colors vary according to the condition under which the test is applied. Prescott, in his new and valuable little work on proximate organic analysis, p. 144, devotes much space to Frœhde's reagent, which is a solution of molybdate of sodium, 0.01 grain, in concentrated sulphuric acid, 10 cc., and gives a table showing the reaction with the reagent, and with pure sulphuric acid. I do not think that the indications which he presents there were proven with proper care ; he states that morphia is colorless with concent. sulphuric acid—it gives a wine-red color. These test solutions of molybdic acid, or molybdates in sulphuric acid, all give like reactions, (varying slightly in intensity of color). My experiments prove them to be unreliable, and therefore worthless, for determining the presence of the alkaloids ; for instance, pure quinia gives little or no color, but some of its salts at once yield a reaction ; bromide and iodide, deep blue ; ferrocyanide, red ; tannate, red-brown.

The maroon color which Dr. Southey produced with morphia, and is produceable with other bodies, is caused by the red color, given with the sulphuric acid, blending with the blue hydrate of molybdenum, which is formed by the reduction of molybdic acid and the molybdates, when brought in contact with certain organic matters ; the variable green color is produced by blending with the yellow color given to many organic bodies by the action of sulphuric acid, and when these solutions produce a red, yellow or brown coloration, with an organic principle, the reaction is simply with the sulphuric acid, the molybdates taking no part in it.

Solution of the proto-salts of tin, zinc or copper, yield a deep blue color with the molybdates.

There is no more need of molybdic acid, or molybdates, in these test solutions than for the presence of any other blue coloring matter, which will blend with the color produced by sulphuric acid, and produce tints which, while pleasing to the eye, confuse the analyst.

LABORATORY NOTES.

BY E. S. WAYNE.

Damiana.—A quantity of this new remedy, purchased in New York, and similar to that figured as No. 3 in the November (1875) "Journal of Pharmacy" (page 578), was made into fluid extract. The drug was exhausted with 76 per cent. alcohol. The filtered extract, upon standing for several days in a glass vessel, deposited all over that part of the vessel filled with it, a crystalline crust. The extract was poured from the bottle and crystals removed, which upon examination were found to be, not a proximate principle, as I expected, but chloride of potassium.

Eucalyptus globulus.—In the preparation of the fluid extract of this substance, I have not been able to obtain a preparation that would not in a short time form a copious precipitate, supposed to be chlorophyll. The green appearance of it warranted that opinion, but when separating it from the extract, and examining it, I found that chlorophyll formed only a small part of the mass. I dissolved the precipitate in alcohol, filtered it through bone black, and obtained a light-colored solution, free from the green chlorophyll. This was then treated with an alcoholic solution of plumbic acetate, which was added as long as it gave a precipitate; this was filtered, and sulphydric acid passed into the filtrate, to remove excess of lead. After removing the sulphide of lead, the filtrate was placed in a loosely covered vessel, to evaporate spontaneously. As the alcohol evaporated, crystals began to form on the sides of the bottle, and by slow evaporation a confused crystalline mass was obtained, retaining the peculiar odor of the substance. I could not make out the crystalline form, but removed the crystals and reduced them to a powder, the color a pale ochre tint. The substance is soluble in ether and chloroform; its alcoholic solution gives, with ferric chloride, a dark brownish-red color. The precipitate consequently contains, besides chlorophyll and tannic acid, a peculiar crystallizable acid resin, which gives a brown-red reaction with ferric chloride.

ALOIN.

BY CHARLES L. MITCHELL, PH. G.

(Read at the Pharmaceutical Meeting, Dec. 21st, 1875.)

The subject of aloin having lately been again brought to the notice of the pharmaceutical world by the experiments of Mr. Tilden, it occurred to the writer to undertake some experiments on aloin, in order to ascertain if a good article could not be prepared by some reliable process, not too difficult for general adoption.

The grades of aloin, as found in the market, have occasioned much distrust of its value as a medicine, on account of the unreliability and uncertainty attending their use, very often being almost inert. Aloin, when of a good character, is a very safe and efficient cathartic and purgative, acting freely in doses of from 1 to 3 grs. It affords a convenient and efficacious method of obtaining the remedial effects of aloes in a concentrated form.

In making these experiments the process of Mr. Tilden (*Am. Jour. Pharm.* 1871.) was followed. "One pound of good Barbadoes aloes was broken up and dissolved with heat in 1 gal. water, acidulated with f3ss sulphuric acid, and after perfect solution, was set aside for twenty-four hours to cool. The supernatant, clear liquid was poured off from the resin (which is comparatively inert), and evaporated by a gentle heat to about 2 pints, and then set aside for several days. On examining the liquid at the expiration of that time, a heavy crystalline deposit of a yellow color was found on the bottom and sides of the vessel. This was collected on a filter, washed with a little ice-cold water to remove coloring matter, well drained and dried. This aloin is rather impure. It can be rendered quite pure by dissolving it in warm water, decoloring with animal charcoal, and again evaporating and crystallizing.

Aloin, thus obtained, is of a yellow color, crystalline, and of an extremely bitter, aloetic taste. It is slightly soluble in cold water, very soluble in hot water, and soluble in alcohol. The yield was about 600 grains.

Some of this aloin was made up into pills, and it purged actively in doses of 2 grs.

The liquid from which the crystalline deposit had been separated was evaporated to extract consistence, yielding about 10 ounces of a very good article of extractum aloes.

The main point to be considered in the preparation of a reliable article of aloin, is the selection of a good grade of aloes. Barbadoes

aloes is generally the best, on account of the aloin obtained from it, being much more easily separated and more active, than that obtained from the other varieties of aloes. Natal aloes, lately quite prevalent in the market, also affords an extremely handsome "looking" article of aloin, but unfortunately it, as well as the aloes itself, is very weak in its action; 15 and 20 grs. of the aloin having been taken with the result of only a slight purgative action.

The writer also examined an article of aloin prepared from a grade of aloes, called Curaçoa; but this was also quite weak in its action.

The best means of detecting the nataloin is by its reaction with strong sulphuric acid, and the vapor of nitric acid, as proposed by Histed. Add a few grains of the suspected aloin to several drops of strong sulphuric acid, and then pass a glass rod, moistened with strong nitric acid, gently just over its surface. The presence of nataloin will be indicated by the blue color which immediately results. Barb-aloin can be detected by its reaction with strong nitric acid, giving a red color.

WAFER CAPSULES AS A MEANS OF ADMINISTRATION OF MEDICINES.

BY WILLIAM M^CINTYRE, PH. G.

(*Read at the Pharmaceutical Meeting, December 21st.*)

In the "American Journal of Pharmacy," 1873, page 190, and 1875, page 213, notices have appeared describing such wafer envelopes or capsules.

Recently attention has been specially directed to the advantages of this method, and there have appeared in the market wafer discs and presses to enable the druggist to dispense them. The want of information as to their production and the expense attending upon the press has proven a barrier to their general introduction.

The plan consists in having two small concave wafer discs to fit each other in such manner that when joined a perfectly sealed envelope or capsule is formed, thus rendering feasible the administration of such medicines as are free from moisture, in a tasteless and odorless manner, also allowing the presentation in one envelope of two substances, separated by a middle leaf of wafer paper, with the intention that they unite in the stomach, and form a salt in the nascent state.

It is possible to secure all these advantages by means of apparatus

and wafer discs that can be prepared by any one at a very trifling outlay.

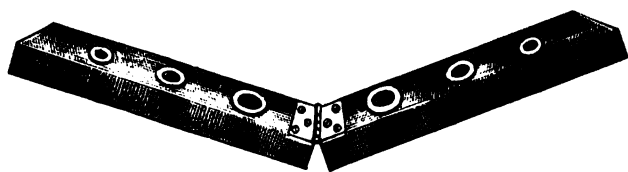
To prepare the capsules, the mode of proceeding is as follows : Procure wafers in sheets such as are used by fancy-cakes-bakers. Cut them into circular pieces by means of a hollow punch. One of these is slightly dampened by placing it between wet muslin cloths, removed and inserted between two tin plates which have been prepared of the desired shape of the finished disc ; after pressing together the plates, the wafer will have received the desired impression and is ready to receive whatever suitable combination the physician may desire to prescribe.

I have, however, found wafer sheets which could not be moistened and worked to advantage in this way ; but these can be managed without this treatment, if the tin plates are heated, the flat wafer inserted, and pressure applied as before.

These latter have a highly polished surface, and can be manufactured with greater rapidity than the former.

The use of the press is to seal the wafers. This is accomplished by properly moistening the internal surface of the rim of one wafer, upon which has previously been placed the medicine, and covering this with another, and submitting to pressure. This moistening is done by an apparatus formed by taking two hollow metallic cylinders, differing in diameter, enclosing one within the other and filling the intervening space with round lampwick or flannel cloth, which is allowed to slightly project. This is moistened by applying it to a piece of flannel which has been previously wetted ; or one of the discs may be pressed upon a moistened cloth until the rim is in such condition that when applied to the filled disc it will adhere.

Our fellow-member, E. M. Boring, has devised a press which



answers all requirements, and is yet so simple in its construction that any one can, in a short time, with comparatively no expense, make one.

It consists of two pieces of one-and-a-half-inch hardwood board,

two inches wide and nine inches long, joined together at one end with a good hinge. The pressing surfaces consist of concave pieces of brass or metal, having a rim corresponding to the various sizes of wafer-discs sunk to a proper level and fastened into the body of the press. For these, buttons for stair-rods answer every purpose.

The medicated capsule is now ready for the patient, who will be thus enabled to take such bitter substances as quinia, aloes, &c., without perceiving the least taste whatever, and requiring very little effort to swallow, all that is requisite being to dip the wafer for a moment in cold water, place it upon the tongue, and swallow with a very small drink of water.

VINEGAR BITTERS.

BY OTTMAR EBERBACH.

(Abstract of a paper presented to and published by request of the American Pharmaceutical Association, Sept. 1875.)

The appearance of this compound reminds one very forcibly of a mud-hole in clayey soil, for it looks as if it was taken from such a depository and bottled; this, probably, explains why the proprietors have their wrappers so firmly fixed over their unsightly mixture. On opening the bottle it gives a slight report, indicating the presence of some gas; its odor is that of a mixture of oil of anise and aloes, its taste sour, very bitter, with an anise flavor.

To determine the composition of this nostrum, the author subjected the contents of a bottle to distillation, passing the gas through an ammoniacal solution of barium chloride, in which a white precipitate was produced (carbonic acid). The distilled liquid was found to contain oil of anise, acetic acid and alcohol, the presence of the latter being proven by the acetic ether and iodoform tests.

The balance of the contents of the bottle was neutralized with ammonia, evaporated to dryness, and the residue exhausted with absolute alcohol; insoluble portion marked A, soluble portion, B. The latter was exhausted with cold water; the solution, after long-continued boiling with dilute sulphuric acid, yielded to ether paracumaric acid, recognized by its solubility and the golden yellow color produced with ferric chloride; the presence of aloes was thus proven.

The portion of B, which was insoluble in cold water, was partly soluble in chloroform; the remainder, dissolving in solution of carbonate of sodium, was free from the resins of colocynth and jalap, and con-

sisted of resin of aloes. The chloroformic solution left, on evaporation, a residue which was soluble in boiling solution of sodium carbonate, and reprecipitated by sulphuric acid as dirty yellowish flakes, which were indifferent to carbon bisulphide (absence of gamboge), but dissolved in alcohol, and then yielded with ferric chloride, chlorine water and bichromate of potassium the characteristic green coloration of guaiac.

In the residue A, the presence of sulphuric acid and soda was easily proven. A portion of it was dissolved in water and precipitated by strong alcohol. In a portion of this the presence of sugar was indicated by Trommer's test; another portion of the watery solution was turned milky by oxalic acid and gelatinized by concentrated solution of ferric chloride; presence of gum arabic.

Summing up the results, we find that this humbug is composed of the following rare native herbs of the West, as collected by such Indians and associates as Dr. J. Walker, viz., Cape aloes, Glauber's salt, gum arabic, gum guaiac, acetic acid, carbonic acid, alcohol and oil of anise.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Citrate of Lithium, prepared in accordance with the British Pharmacopœia (100 parts of carbonate of lithium and 180 parts of citric acid), has, according to C. Umney, a distinct alkaline reaction, while that made by the United States formula (100 carbonate of lithium to 200 citric acid) is strongly acid. 100 parts of pure carbonate of lithium will be required to neutralize 189.2 parts of citric acid, the product of anhydrous lithium citrate being identical with the amount of citric acid employed. If commercial carbonate of lithium of fine quality contain 98.5 per cent. of real carbonate, then the proportions would be 100 parts of carbonate and 186.5 parts of citric acid. Lithium citrate, prepared from these proportions and rendered anhydrous, was neutral to test-paper. A solution of specific gravity 1.230 when set aside produced crystalline citrate of lithium, which appears to have the formula $\text{Li}_3\text{C}_6\text{H}_5\text{O}_7 + 4\text{H}_2\text{O}$ at 100°C . (212°F .); this salt loses three molecules of water, the fourth being given off at 115° (239°F .), leaving about 73 per cent. of anhydrous citrate. Ten commercial samples were examined; they left, when dried at 100°C ., residues varying in weight between 76.5 and 85.2 per cent., and at 115°C . from 72.9 to 83.8

per cent. of anhydrous citrate. Mr. Umney advocates the adoption of the crystallized salt, which is thoroughly definite and reliable and whose appearance would guarantee its uniformity. The definition of "delinquescent," applied by the two pharmacopœias, is inaccurate.—*Pharm. Jour. and Trans.*, 1875, Sept. 11.

Bromide of Lithium is prepared by Yvon by mixing 37 grams of carbonate of lithium, 200 grams of distilled water and 80 grams of bromine, and passing a current of sulphuretted hydrogen through the mixture until the color of bromine has disappeared. A slight heat is then applied to drive off excess of sulphuretted hydrogen and to agglutinate the sulphur. After filtration, the liquor is concentrated and finally crystallized by desiccating it under a glass over sulphuric acid.

It may also be obtained by double decomposition. Sulphate of lithium is first formed by treating 37 grams of carbonate of lithium with 49 grams of monohydrated sulphuric acid, diluted with its own volume of water. On the other hand, 119 grams of potassium bromide are dissolved in the smallest possible quantity of water. When the two solutions are mixed, an abundant precipitate of potassium sulphate is produced and increased by the addition of a little alcohol. The whole is evaporated to dryness, finishing the operation on a water-bath, and the residue is treated with alcohol which removes only bromide of lithium and deposits it again on evaporation. The bromide may then be crystallized from water or kept in solution of known strength.—*Ibid.*, Sept. 18.

Combinations of glacial acetic acid with oils.—As a continuation of his paper on the solubility of alkaloids in oil ("Am. Jour. Pharm.," 1875, p. 540), Mr. J. B. Barnes communicates the following results of his experiments.

The *minimum* combining proportions of the following five commercial samples of oil are, for one volume of glacial acetic acid, almond oil 7 vol., olive oil, 8 vol., codliver oil, 7 vol., linseed oil 7 vol., and oil of rhodium 4 vol.

The *maximum* combining proportions of the next five are, for one volume of the acid, oil of turpentine, $\frac{1}{2}$ vol., oil of lemon, 2 vol., oil lemon grass, 2 vol., oil of lemon grass, 2 vol., oil of copaiba, $\frac{1}{8}$ vol., oil of juniper, 1 vol.

The following 41 oils will mix with glacial acetic acid in all proportions: castor, cloves, croton, caraway, rosemary, sandal, cajeput,

orange, bergamot, anise, almonds (bitter), origanum, chamomile, eucalyptus, sage, cinnamon, cassia, lavender, myrtle, marjoram, pennyroyal, citronella, pimento, sassafras, calamus, spearmint, wormwood, neroli, cubeb, coriander, cumin, peppermint, geranium, male fern, citron, fennel, rue, savin, amber, nutmeg and essential oil of mustard.—*Ibid.*

Preservation of Hydrocyanic Acid.—Mr. John Williams has continued his experiments on the preservative influence of glycerin upon hydrocyanic acid (see "Am. Jour. Phar.," 1874, p. 487). Two samples, of ten fluidounces each, and containing respectively 4.5 and 2 per cent. of acid, were put in pint bottles, glass stoppered, but not tied over or inverted; each contained 20 per cent. of Price's pure glycerin. The bottles were opened after six and twelve months, and the acids were found not to have diminished in strength or altered in appearance. German glycerin was found to assume a yellow color with hydrocyanic acid.—*Ibid.*, Sept. 25.

Syrup of Tolu.—Regarding the resin of tolu as the main or sole active principle, Henrotte is in favor of retaining it in the syrup, and effects its permanent emulsion in the following manner: 10 grams of finely-powdered tragacanth are triturated with sufficient simple syrup to form a mucilage; 40 grams of tincture of tolu are added and an emulsion made, to which enough simple syrup is added to make the whole weight 1,000 grams.—*Jour. de Phar. d'Anvers*, 1875, p. 337–339.

Administration of Raw Meat.—Dr. Lailler proposes to mix 100 grs. of grated raw meat with 40 grs. of powdered sugar, adding afterwards 20 grs. of Bagnols wine (sparkling?) and 3 grams of tincture of cinnamon. This mixture has an agreeable taste and is easily digested.—*Jour. de Phar. et de Chim.*, 1875, Nov., p. 367.

Solubility of Borax in Glycerin—According to Gandolphe, glycerin dissolves, at the ordinary temperature, its own weight of borax by triturating them in a mortar, or more rapidly by applying the heat of a water-bath. This solution which keeps unaltered is well adapted for mouth washes after the addition of some clarified honey or honey of roses. 100 parts of water dissolve only 8.33 parts of borax. Boracic acid is likewise more soluble in glycerin than in water, but not to the same degree as borax.—*Ibid.*, from *Union Phar.*

Test for Sulphocarbonates.—A. Mermet proposes for this purpose an

ammoniacal solution of sulphate or chloride of nickel, diluted with water until it appears colorless. A few drops of a solution of sulpho-carbonate will produce with the reagent a very characteristic currant color; while liver of sulphur, which is occasionally sold as sulphocarbonate, produces a yellow, and the alkaline monosulphides a brown or black color.—*Ibid.*, p. 352.

Devorative Capsules.—Under this name, the chemical factory of Helfenberg, near Dresden, has introduced capsules which are made of a material similar to sheet wafers, but rolled out very thin like vellum paper. It is used like ordinary powder paper, except that after the powder has been put upon it the length margin is moistened with water by means of a hair pencil; it is then folded in the usual way, the ends being likewise fastened by the aid of moisture. The entire capsule with contents is swallowed after having been dipped in water and, if necessary, rolled up.—*Phar. Centr. Halle*, 1875, No. 42.

REPORT ON THE DEVELOPMENT OF THE CHEMICAL ARTS DURING THE LAST TEN YEARS.*

BY DR. A. W. HOFMANN.

(Continued from page 559 of last volume.)

HYDROGEN.

Of the three properties to which the industrial applications of hydrogen are applicable two are of so striking a nature that they cannot have escaped the earliest observers. To them it appeared as the combustible principle, the "volatile sulphur;"† subsequently, it was regarded as the long-sought-for phlogiston,‡ or as the "inflammable air," of which all combustible gases were mere varieties. In modern times, this previously vague knowledge has been rendered definite, recognizing in hydrogen the greatest heat of combustion, and consequently the property of producing the highest degrees of heat and light, properties which met with a practical application at an early date.

The low specific gravity of hydrogen did not escape the earliest observers. Being scarcely ponderable, it excited the idea of imponderable bodies, and its specific lightness, as well as its great heat of combustion, soon met with a striking application.

A third attribute is of a less manifest nature. Occasionally destroying colors, but often obtained without any brilliant and striking phenomena, hydrogen in its nascent state is capable of entering into many combinations, of which it is incapable when pre-existing in a free state. It liberates chlorine, oxygen, and other elements from their compounds, and takes their place; or it is deposited in compounds not fully saturated, and fills up the vacancies. This attribute is most weighty for the

* "Berichte über die Entwicklung der Chemischen Industrie Während des Letzten Jahrzehends."

† Lemery, "Memoires de l'Academie," 1700.

‡ Cavendish, 1766.

most recent development of chemistry, as well as of great technological importance. Unawares, this property has been made use of for ages. Upon it depends the transmutation of indigo-blue in the vat into indigo-white, and, consequently, one of the oldest and most important branches of the art of dyeing.

In 1842, Zinin succeeded in converting nitrobenzol into anilin by the action of nascent hydrogen, and thus opened out an industrial region of unimagined extent. The era of the artificial dyes followed. It was soon perceived that many of these substances shared with indigotin the property of being decolorised by hydrogen, and thus zinc-powder was introduced into calico-printing as a discharging agent, which, developing hydrogen in patterns where it is printed on, remove artificial coloring matters, *e.g.*, magenta.*

A series of interesting observations showed, however, that the manner in which hydrogen is evolved is not without influence on hydrogenisation. Whilst ammonium sulphide, and whilst acids under the influence of metals give up so much hydrogen to nitrobenzol as to form anilin; if other sources of hydrogen are employed the reaction is arrested half-way, and intermediate products are generated. Herewith, therefore, nascent hydrogen escapes from our general consideration, and its technical application will be described in future parts of this report.

We return, therefore, to its applications as a source of heat and light. It has been briefly described in the section on oxygen how the oxyhydrogen blast was evolved from the experiments of Saron between 1780 and 1790, and how it was introduced in the manufacture of platinum in the middle of the present century by Deville and Debray. Since 1838† Desbassains de Richemont found in hydrogen mixed with air the means for the autogenous soldering of sheets of lead, and thus supplied the sulphuric acid manufacture with the fundamental condition of its growth, *i.e.*, permanent lead chambers of any desired magnitude. If, in places where coal-gas is readily procurable, this combustible is substituted for hydrogen in soldering lead, many sulphuric acid chambers are not near gas-works, and in them hydrogen is still necessary for soldering. The same must be said on the application of hydrogen for the autogenous soldering of other metals and alloys, a process for which Winckler, in his convincing essay already quoted, predicts a great future. More recently, lead pans soldered in this manner have been introduced in the manufacture of boracic acid in Italy. Numerous conflagrations, especially that of Canterbury Cathedral in 1871, and that of the Alexandra Palace on Muswell Hill in 1873, demonstrably due to the braziers full of fire used in soldering the leaden spouts, have led, in England, to the proposal to solder leaden roofing and spouting with hydrogen.

How far hydrogen is superior to other kinds of fuel appears from the following table. According to the experiments of Favre and Silbermann, 1 grm. of the following bodies, when burnt in water, gave the appended number of calories, *i. e.*, it raised, by 1°, the temperature of the given number of centigrams of water.‡

* The transformation of the colored salts of rosanilin into the colorless salts of leucanilin by means of zinc and hydrochloric acid, was discovered by A. W. Hofmann, in 1860,—*Proc. Roy. Soc.*, vol. xii., p. 2. The above application is due to Durand. See Schützenberger, "*Traité des Matières Colorantes*," vol. i, p. 491.

† Karmarsch, "*Geschichte der Technologie*," 380.

‡ A. Würtz, "*Dictionnaire de Chimie*," vol. i, pp. 825, 826.

Hydrogen,	34'462
Carbonic oxide,	2'403
Oil of turpentine,	10'852
Stearic acid,	9'716
Alcohol,	7'814
Marsh-gas,	13'063
Wood charcoal (burnt to carbonic acid),	8'080
Ethylen,	11'858
Ether,	9'028

The temperature of the flame does not, however, depend exclusively on the heat of combustion. The density of the burning body and the specific heat of the products of combustion must also be taken into account. Hence it comes that the temperature of the hydrogen flame in pure oxygen is about 6800° , in air about 2600° ; the temperature of the flame of carbonic oxide in oxygen amounts to 7000° , in air about 3000° ; * further according to calculation 1 vol. of hydrogen = 1 grm. is capable of fusing 205 grms. of platinum, whilst the same volume of carbonic oxide can fuse 238 grms. of platinum (melting-point, 2000°). In practice, however, even under the most favorable conditions, as Deville and Debray determined in their researches on platinum, about half the heat is lost by conduction to the furnace and other surrounding matter, and the above authorities with 120 litres of hydrogen and 60 of oxygen succeeded in fusing only 1 kilo. of platinum instead of double the amount as calculated. Platinum can also be smelted and refined under similar circumstances with coal-gas. But for the more infusible metals of the platinum group, iridium, ruthenium, and their alloys, the hydrogen flame must be retained, which, if costlier than coal-gas, is cheaper than carbonic oxide.

In the use of gases as fuel, the metal itself can be brought in contact with the flame, which is impracticable in case of carbon, and thus the great loss of heat is avoided which ensues when the crucible is heated from without. Their application renders it also possible to inspect the condition of the metal at any moment. In the metallurgy of the common metals these two advantages do not come into consideration. Carbon, moreover, is not only the cheapest but the most productive fuel,† and the application of hydrogen as a source of heat seems therefore limited to auto-genous soldering and to the fusion of the most refractory platinum metals.

The property of platinum-black to ignite hydrogen, of which Döbereiner made a well-known and widely utilized application in his hydrogen lamp in 1823, has lost its practical importance owing to the discovery of friction matches.

The more intense and permanent was the interest which hydrogen created as a source of light.

As the luminous power depends on the temperature at which a solid ignited body is maintained, the suggestion was near at hand to produce an intense light by means of this gas, in which an incombustible body was heated to whiteness. To this end the Scotch military engineer Drummond used in 1826 cylinders of caustic lime heated in the oxyhydrogen flame. The Drummond light has been widely employed,

* Debray "Sur la Production des Températures Elevées et sur la Fusion de la Platine." Leçons de Chimie en 1861, 65; Paris, 1861.

† The calculated temperature of the flame of carbon in oxygen is $10,000^{\circ}$, from which has to be deducted the unknown amount of heat which at this temperature is lost by dissociation. See Debray, *opus citat.*

not merely in geodetic measurements and in lighthouses, which the inventor had principally in view, but also for projections of microscopic objects and photographic images on glass, or drawings upon gelatin for demonstration in lecture-halls,* for dissolving views, and chromatropes. In the American civil war it was used in sieges to light up forts.† The English war department has tried it in barracks, in large halls and courts, in which‡ it is said to have proved cheaper than coal-gas, whilst the smallest characters could be read at a distance of 90 metres from the source of light.

Since lime partially loses its luminous power by continued use, platinum-wire, magnesia, and latterly zirconia, have been employed in its stead.§

The above-mentioned application of the hydrogen lamps are, however, of a very limited nature. To utilize it on the large scale for street lighting, the simultaneous use of oxygen has been laid aside, and cheaper methods of preparation have been sought for. For this purpose advantage was taken of Felice Fontana's method of decomposing water by means of ignited iron and ignited carbon, as proposed in 1780.¶ On the latter scheme Donovan founded his industrial preparation of hydrogen gas in Dublin, in 1830. His process has been repeatedly described with modifications, referring in part to the needful apparatus, and in part to the diminution of the proportion of carbonic oxide. The presence of this poisonous gas was at first justly urged as an argument against the use of the "water gas." Langlois found that the mixture obtained—on allowing steam to pass over iron retorts filled with red-hot coke in Kirkham's apparatus—had the tolerably constant composition of 58 to 60 per cent. of hydrogen, 19 to 26 carbonic oxide, and 15 to 20 carbonic acid.

It was subsequently, however, discovered|| that at higher temperatures carbonic oxide is oxidized by watery vapor to carbonic acid, so that if the steam is in excess a gas may be obtained relatively free from carbonic oxide, as shown in the reaction $-C + 2H_2O = 4H + CO_2$. In the water-gas prepared at Narbonne, where the gas on issuing from the retorts is conducted through ignited tubes along with fresh quantities of superheated steam, Verver** found in 1858, 3.54 per cent. of carbonic oxide. According to other observers the amount ranged from 2.5 to 5 per cent. In the water-gas at Passy, Payen found 6 per cent. of carbonic oxide, whilst in ordinary coal-gas he found an average of no less than 14 per cent. The above-mentioned objection, therefore, no longer holds good.

The carbonic acid is removed by milk of lime, or, perhaps, more economically, according to the suggestion of Heurtebise†† by soda, which is thereby converted into bicarbonate, a readily saleable substance.

Fayes‡‡ constructed for lighting the town of Narbonne an apparatus which he

* This Report, Nov., 1875, p. 509; also H. Vogel, "Ber. d. Chem. Gesell.," iii, 901.

† Wagner, "Lehrbuch der Technologie," 9th edit., ii, p. 377.

‡ "Journal of Gas-lighting," 1869.

§ See the work of Phillips, quoted above.

|| *Mem. Soc. Ital.*, xv.

¶ Bromeis, *Zeitsch. d. Ver. deutsch. Ing.*, iii. 82, and *Dingler Polyt. J.*, clxiv. 33, 1859.

** B. Verver. "L'éclairage au gaz à l'eau à Narbonne et l'éclairage au gaz Leprince." Leiden 1858. See Bromeis, *opus citat.*

†† Heurtebise, *Dingl. Pol. J.*, cxxcvi. (1), 393, 1867.

‡‡ Fayes, *Genie industriel*, 1868, 399. *Dingl. Pol. J.*, clxx. 47.

named gasogen, which furnished in twenty-four hours 1,000 to 1,200 cubic metres of purified gas, the cost of which, independent of labor, and of the cost and depreciation of plant, he calculates as follows:—

For 100 Cubic Metres of Gas.

	f. c.
75 kilos of coke at 0.03 franc	2 25
55 " coal at 0.025 "	1 37
82 " lime	82
	<hr/> 4 44

The material costs, therefore, 4½ centimes per cubic metre.

Instead of decomposing water by carbon, certain other processes have recently come into use, and require notice.

Lenoir's process,* suggested in 1867, is of very limited applicability. He decomposed barium sulphide with water, obtaining sulphate of baryta and hydrogen— $\text{BaS} + 4\text{H}_2\text{O} = \text{BaSO}_4 + 4\text{H}_2$. This process is only practicable where the manufacture of barium sulphate (permanent white) is the main object, and the hydrogen a by-product, as was the case with Lenoir.—*Chem. News*, Sept. 17 to Oct. 8.

VARIETIES.

VEGETABLE MUCILAGE. By W. Kirchner and B. Tollens.—The authors, after a critical review of the various investigations that have been made in connection with this subject, describe their process for the purification of the mucilage, which is very similar to Schmidt's. The mucilage, after the addition of hydrochloric acid, is precipitated by alcohol and, when the operation has been repeated six or eight times, the product is repeatedly washed with absolute alcohol, and finally with ether. By this means the ash is reduced to a minimum, and the mucilage, when dried, is obtained as a porous mass, and not in hard lumps.

Quince mucilage was obtained principally from quince seeds, by digesting them in water for four hours, then rubbing them through a hair sieve, boiling, and straining through linen. After purification it is greyish-white and swells up, when soaked in water, to a gelatinous mass, forming a mucilaginous solution only on the addition of a small quantity of potassium hydrate. It still contains 4 to 5 per cent. of mineral matter, and on analysis gives numbers corresponding with the formula $\text{C}_{12}\text{H}_{20}\text{O}_{14}$. When it is boiled with dilute sulphuric acid, white flocks are precipitated, and sugar and dextrin or gum are produced. From the results of numerous carefully conducted quantitative experiments, it would seem that the flocculent precipitate of cellulose is nearly constant after the first half-hour, however long the boiling may be continued, but the percentage of gum gradually decreases, whilst that of the sugar increases within certain limits, showing the conversion of the former into the latter. The gum polarizes lævorotary; the sugar, which reduces cupric solution, dextro-

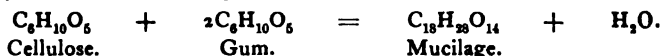
* Lenoir, *Wagn. Jahrbuch*, 1867, 219, 259.

rotary. The flocculent precipitate, amounting to about 36 per cent., gives the reactions of cellulose with iodine, but in the analysis the carbon comes out slightly higher than that required by the formula $C_6H_{10}O_5$. This is probably due to the presence of some impurity similar to the compound found in fir-wood by J. Erdmann.

Linseed Mucilage.—Linseed treated in a manner similar to that above described gave numbers corresponding with the formula $C_6H_{10}O_5$, or the same as that of cellulose. When boiled with dilute sulphuric acid, it decomposes like quince mucilage, but with much greater difficulty, gum and sugar being formed, and the former being gradually converted into the latter by long-continued boiling. The insoluble residue is very much smaller than with quince mucilage, being only about 4 per cent.

Fleabane Mucilage.—This has the formula $C_{26}H_{38}O_{25}$. Boiled with acid, it decomposes like the other mucilages, yielding gum and sugar, but in this instance the gum is *completely* converted into dextrorotary sugar by long-continued boiling.

From these results the authors infer that in quince mucilage the cellulose exists in combination with the gum, since no cellulose can be distinguished as such by microscopical examination, and as the two substances exist in the ratio 1 : 2, it is most probably a true chemical compound :



It has yet to be determined whether the other two mucilages are distinct, or whether they are compounds of cellulose and gum in the proportion 1 : 2, mixed with excess of gum : the different behavior of the fleabane mucilage when treated with acid from that of the quince would, however, seem to preclude this view.

The concluding portion of the paper is occupied with theoretical speculations as to the manner in which the carbohydrates may become transformed, the one into the other—*Jour. Chem. Soc.* [Lond.], Nov., 1875, from *Annalen der Chemie*, clxxv, 205–226.

MUTUAL DISPLACEMENT OF ACETIC AND FORMIC ACIDS. By H. Lescœur.—It is generally known that formic acid can expel acetic acid from its combinations, but inversely acetic acid has been found also to displace formic acid. When a mixture of acetic acid and sodium formate is distilled, a very considerable quantity of formic acid is found in the distillate, but even with a large excess of acetic acid complete decomposition of the formate was never obtained.

The majority of the formates soluble in acetic acid are decomposable in like manner, some indeed without even the application of heat ; thus, potassium formate dissolves in acetic acid, and if allowed to evaporate spontaneously, gives a residue consisting mainly of potassium acetate. There would appear, therefore, to be an equilibrium established between the quantity of formic acid set at liberty, and acetate formed in a manner similar to that which has been noticed in many other instances by different operators.

When one part of sodium formate is dissolved with heat in five parts of monohydrated acetic acid, crystals are obtained on cooling, which were found to have the composition, $NaC_2H_3O_2 \cdot 2C_2H_4O_2 + NaCHO_2 \cdot 2CH_3O_2$.—*Journ. Chem. Soc.*, November, 1875, from *Bull. Soc. Chim.* [2], xxiii. 259.

MINUTES OF THE PHARMACEUTICAL MEETING.

The third regular meeting of the session was held December 21st, 1875, Dr. W. H. Pile in the chair. Number in attendance, sixty. The minutes of the previous meeting were read and approved.

Prof. Maisch presented to the library, on behalf of J. C. Rumph, a catalogue and price list of *Materia Medica*, "*Catalogus et Valor Materiae Medicæ, seu medicamentorum simplicium et compositorum in officinis Molhusinis prostantium*," printed in 1715. Besides much curious information, it contains the oaths, as administered to apothecaries and physicians in the beginning of last century. Charles Bullock thought the disposition to present such works ought to be encouraged; they would be valuable for our library, as giving the antiquities of our business. Prof. Remington called attention to the suggestion that had been made by W. C. Bakes, of making a collection of pharmaceutical books and apparatus possessing historical interest. Wm. McIntyre presented a copy of "*The Popular Health Almanac*," and a press for sealing wafer capsules.

Prof. Remington read a paper on aloin, by Charles L. Mitchell, (see page 24). Prof. Maisch asked for further information, concerning the extract described as being made from the mother liquid after the separation of the crystals of aloin. Prof. Remington said it had the appearance of a good extract. Some members, however, thought that it should not be used for the extract of aloes, as officinal in some European pharmacopœcias. I. J. Grahame believed the results claimed for the administration of aloin, as a substitute for aloes, had not been realized. The therapeutic effect of the various aloins is different; it is sold at a high price, and requires to be given in comparatively large doses. On the other hand, aloes is used more frequently as a laxative than as a cathartic, and with a good article, the dose is not large.

Wm. McIntyre read a paper on wafer capsules, as a means of administration of medicines (see page 25). Prof. Maisch said wafers in sheets, had long been in use in Europe for this purpose. The introduction of the wafer capsules, by Limousin, had at first materially increased this mode of medication; but it appeared that their use there was already on the decline, and he believed their apparent advantages would not supplant the American methods now in use. R. V. Mattison had become familiar with them two years ago, while in the West, where their use had greatly diminished; he regarded them as an elegant novelty. James Kemble related an incident, showing that sheet wafers had been used in Pennsylvania years ago, for the administration of powders, the wafer being rendered pliable by dipping it into water. Prof. Remington had used the capsules to a great extent, found them to answer a good purpose and claimed for them rapidity of action. Prof. Maisch suggested that a solution would act with still greater rapidity. Charles Bullock did not believe that a greater amount of action could be claimed by the choice of one form of administration over another. The effect of a pill is equal to that of a powder, it may require a little more time; but will frequently cause the medicine to be retained when the stomach would reject the same medicines when given in some other form. J. B. McElroy had used the French wafers, and considered them

very neat. E. C. Jones claimed the use of a press as unnecessary, having seen the rim of two turned wood boxes used as a substitute. Prof. Remington said that two empty morphia bottles had been used by some in place of a press.

On motion, the papers read were referred to the publication committee.

Prof. Maisch exhibited a series of botanical models, made by Robert Brendel, of Berlin, Germany, which have been recently imported, to be used for the illustration of the lectures on botany and Materia Medica. These models are faithful representations of the flowers and other parts of plants belonging to different natural orders, magnified to such an extent that the different parts can be readily seen at some distance; they are painted in the natural colors of the organs which they represent, and many of them can be taken apart so as to exhibit their internal structure. Amongst the models shown were those of *Aconitum Napellus*, *Viola tricolor*, *Conium maculatum*, *Hypericum perforatum*, *Maruta cotula*, *Digitalis purpurea*, *Colchicum autumnale*, *Atropa belladonna*, the flowers of the potato, strawberry, apple, cherry and others, the entire series comprising sixty-five numbers, of which twenty-five consist of from two to four distinct models.

E. M. Boring directed the attention of the meeting to the following prescription :

℞	Quiniæ sulphatis,	gr.xvi
	Tinct. ferri chloridi,	℥iiss
	Acidi phosphorici diluti,	℥i
	Syrupi,	℥iiss
	Aquæ, q.s. ad.	℥iv

A white precipitate being formed, the ingredients were mixed in various ways, and the quinia dissolved in the necessary quantity of dilute muriatic acid, with the effect merely of delaying the appearance of the precipitate. The phosphoric acid used had been made of phosphorus, and the precipitate, having been found to be ferric phosphate, several other samples of dilute phosphoric acid were procured and tested with solution of ferric chloride containing no free acid, by adding 3 drops of the former and 2 drops of the iron solution to one drachm of water, when precipitates would occur. Upon reversing the proportions, using 2 drops of acid and 3 of iron, two of the samples gave precipitates, one became opalescent and two remained clear. One of the latter had been made by Prof. Markoe's process. On mixing the acid with an equal quantity of tincture of iron, diluting this with water, as directed in the prescription, one-half the quantity of the quinia was added, and the solution remained perfectly clear, while the whole quantity of quinia ordered almost immediately caused the appearance of a precipitate. The inference drawn from his experience was, that testing with neutral chloride of iron some definite proportion should be given, because if carried to very dilute solution the resulting phosphate of iron would not remain in solution. This was not so readily observed in using the tincture of chloride of iron, which contains free hydrochloric acid.

I. J. Grahame had met with the difficulty as early as 1868. He had been able to prepare an acid from the glacial acid that would mix clear with tincture of chloride of iron by prolonging the time of heating. The details of the "Pharmacopœia" he regarded as not specific enough in this case.

Dr. Pile said all the glacial phosphoric acid that had lately been examined was found to contain phosphate of sodium, and no means of getting rid of this contamination had been presented. R. V. Mattison thought that if we are aware of this

adulteration, it would not be proper to prepare the medicinal acid from it. There is some difficulty in getting rid of the nitric acid, and too high a heat will generate pyrophosphoric acid.

Prof. Remington suggested, that if an acid which would not at first mix clear with the tincture, were allowed to stand some time, a change would take place; and said that an acid could not be made from the glacial acid that would answer for this purpose unless free nitric acid was purposely left in it. Prof. Maisch did not agree in this statement. Like Prof. Grahame, he had observed glacial phosphoric acid containing sodium compound to be completely converted into orthophosphoric acid; it is an old method, practiced in analytical laboratories, to convert pyrophosphates into orthophosphates, by boiling them with nitric acid. He had pointed out, three years ago, to a number of persons, the cause of the difficulty with the dilute phosphoric acid made from glacial acid. J. W. Worthington had avoided this difficulty by preparing the acid from phosphorus, procured from the manufactory on the Rancocas, which he believed was the only one of the kind in the country.

Dr. Pyle had tested the acid prepared by Prof. Markoe's process for ammonia, by saturating with caustic soda, but did not perceive any odor of ammonia. A sample of an acid, prepared by the same process by A. P. Brown, was tested by Prof. Maisch, and found to contain some ammonia.

Dr. A. W. Miller read the following note on "*Gentiana catesbaei*:"

"Mr. M. E. Hyams, of Statesville, N. C., in a recent communication to the writer, states it as his firm belief that no true root of *Gentiana catesbaei* is to be found in the market. Mr. Hyams states, that among the gatherers in the South the *Triosteum perfoliatum* is known as American gentian, and therefore invariably sent out as blue gentian, although there is a marked difference in the appearance of the two roots, as well as in that of the plants.

"The term 'horse gentian' is given by Gray as a synonym for the triosteum. According to Mr. Hyams, none of the gatherers in his vicinity are acquainted with the true *Gentiana catesbaei*."

Prof. Maisch had, some years ago, tried to get specimens of the two roots for his cabinet, but could find none in the market. The two have no resemblance whatever, the subterraneous portion of *Triosteum* being a knotty, horizontal rhizome, with long woody roots, while the gentian has a true root, resembling that of *Gentiana lutea*, but being much smaller and lighter in color.

Dr. Miller suggested, that as the gatherers were bringing it in, there must be purchasers for it somewhere.

A. P. Brown presented two specimens of spirit of nitrous ether; one a commercial article, the other made in his store. In addition to containing the proper amount of nitrous ether, about 5 per cent., it makes a transparent mixture with copaiba, which the commercial article fails to do.

Adjourned to meet on January 18, at 8 o'clock P. M.

WILLIAM MCINTYRE, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

NEW YORK ALUMNI ASSOCIATION OF PHILADELPHIA COLLEGE OF PHARMACY.—The regular monthly meeting was held in Plimpton Hall, Tuesday evening, December 7th.

Mr. Thos. D. McElhenie read the following paper :

LINIMENTUM IODOFORMI.—Having frequent occasion lately to dispense iodoform for topical application, I made some experiments to ascertain the best solvent. Without detailing all the results, the following is offered. Almond oil was selected, as its blandness fits it for application to inflamed throats :

Take of Iodoform.....	3i
Camphor.....	aa 3i ʒi
Ol. sassafras.....	3i
Ol. amygdali dulc.....	ʒiv

Powder the iodoform and camphor, introduce into a dry vial, add the oils, and heat in a water-bath, shaking frequently until dissolved. The camphor has the property of increasing the solubility of iodoform in oil, but not in alcohol, and, with the essential oil, serves to cover the odor to which some persons object.

Mr. Wellcome read a paper on the action of solutions of molybdic acid and molybdates in sulphuric acid, as tests for determining the presence of certain organic bodies. He demonstrated by experiments that such tests were unreliable (see page 21). He also presented some specimens of *Grindelia squarrosa*, which he had received from Dr. Bundy, of California. Another species, *Grindelia robusta*, has received some attention as an antidote for poisoning by *Rhus toxicodendron*, and on account of the hypnotic properties ascribed to it ; it formed the subject of a paper by Mr. Steele at the last meeting of the American Pharmaceutical Association. *Grindelia squarrosa* is distinguished from that plant by the flower-head being more compact, with the scales more firm, and terminating in hard, slender and spreading tips. Its medicinal properties are said to be similar to those of *Gr. robusta*.

Some discussion ensued regarding the wafer capsules (cachet de pain), which are being introduced as the model medium for administering nauseous powders. All who had used them spoke of them as a pleasing thing in theory, but practically a nuisance rather than a boon. They were first introduced into Paris about three years ago, and seem to have met with but little favor in Europe, and to deserve the same here.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN—At the pharmaceutical meeting held November 3d, President T. H. Hills in the chair, a paper on the analysis of cinchona bark was read by Mr. Edward L. Cleaver, in which several processes recommended for this purpose were criticized, and a new process suggested, the essential features of which are that a paste of 100 grams of powdered bark and 25 grams of slaked lime is carefully dried and then exhausted with hot methylated spirit; the liquor is acidulated with sulphuric acid, the spirit distilled off, the remaining liquid filtered and evaporated to dryness with pure carbonate of barium, the residue being exhausted with alcohol, which, on evaporation, leaves the total amount of mixed alkaloids; these are exhausted with ether, the solution evaporated, the alkaloids dissolved in dilute sulphuric acid, the solution heated to boiling, and rendered faintly alkaline by caustic soda, when, on cooling, sulphate of quinia crystallizes out; the mother-liquor retains one part of the same salt for every 300 parts, by measure, of the liquid.

In the discussion following, Dr. Paul, Messrs. Linford and Umney, Prof. Redwood and Attfield took part, some sources of inaccuracies being pointed out.

Mr. Nelson T. Carrington read a paper on the chemical formula of commercial molybdate of ammonium, which, from his analyses, he assumes to be NH_4HMoO_4 .

Mr. Thos. Greenish read an interesting paper on Pharmacy in Portugal, in which, among other valuable information, it is stated that Portuguese physicians frequently prescribe foreign nostrums, which are largely imported from France, America and England.

BRITISH PHARMACEUTICAL CONFERENCE.—At the meetings of the Executive Committee, held in November and December, £75 was granted, in sums ranging from £5 to £20, to eight gentlemen, to aid them in undertaking researches on special subjects, the results to be communicated to the next annual meeting, at Glasgow, September 5th and 6th.

The Secretaries announced that the "Year-book" for 1875 was in type, that it would extend to six hundred and fifty pages, that it would be published on or about the 11th of December, and that a copy would be sent, post-free, to every member who had paid his annual subscription.

EDITORIAL DEPARTMENT.

THE FORTY-EIGHTH VOLUME OF THIS JOURNAL begins with the present number, and fully half a century has passed by since the first number of what has subsequently been called the *preliminary* volume was issued, in 1825, its regular and uninterrupted publication, however, dating from the year 1829, since which time a volume has been issued every year. From a quarterly the Journal became a bi-monthly, and, finally, a monthly publication, and its usefulness has made it a welcome visitor to many who are interested in pharmacy, here and abroad. For this we are, in a great measure, indebted to our contributors, who communicated the results of their observations or researches, and we are pleased that the present volume opens so propitiously, with a large amount of original matter from different contributors. It is true that the pharmacist, actively engaged in business, has little leisure for literary labor, but it is equally true that, "where there is a will, there is also a way." The occasions for observations are numerous, even while following the daily routine of business, and if these were noted down and published, they would add to the general stock of knowledge. Amongst the contributors to our last volume, we had the pleasure of welcoming several for the first time, and we take this occasion to invite our readers generally to join the list of those who, for a longer or shorter period, have contributed to these pages, and to record therein their *practical* observations, as well as their *scientific* researches.

POSTAL MATTERS.—Our special thanks are due to our friends in New York, who kindly informed us that the post-office in that city had demanded the payment of double letter postage on the December number, on account of the "Special notice to Subscribers" stitched into it, ruling the same to be an *enclosure*. The matter was at once referred, through the Postmaster of Philadelphia, to the Post-office Department in Washington, from which, under date of December 14th, 1875, the following reply was received:

"Sir;—The publications and letter, submitted with your two letters of 8th Dec., are herewith returned, with the information that the New York office has been advised that printed matter, stitched into the body of a magazine, and having reference to the business of its publishers, is held to be an integral part thereof, and not of the character of matter referred to in Section 148 Laws, or 91 of the Regulations.

"I am, &c.,

(Signed) J. W. MARSHALL, 1st Asst. P. M. Genl.

"GEO. W. FAIRMAN, Esq., Postmaster, Philadelphia, Pa."

The Postmaster of New York has informed the Business Editor that the detained Journals had been delivered immediately after the above decision had been received.

LEAD IN MURIATIC ACID.—Messrs. G. Mallinckrodt & Co., of St. Louis, Mo., have submitted to us a letter from Mr. Fred. Reppert, of Muscatine, Iowa, in which it is stated that the solution of chloride of iron examined by him, and found to contain lead (see December number, 1875, p. 575), had *not* been obtained from that manufacturing house.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Popular Health Almanac for 1876. Edited by Frederick Hoffmann. New York: E. Steiger. 12mo, pp. 44.

Taschenbuch der Geheimmittellehre. Eine kritische Uebersicht aller bis jetzt untersuchten Geheimmittel, zunächst für Aerzte und Apotheker, dann zur Belehrung und Warnung für Jedermann. Herausgegeben von Dr. G. C. Wittstein. Vierte sehr stark vermehrte Auflage. Nördlingen: C. H. Beck'sche Buchhandlung. 1876, 12vo, pp. 301.

Compendium of Secret Medicines. A critical review of all secret medicines analyzed up to the present time. For physicians and pharmacists, also for the instruction and warning of everybody. Edited by Dr. G. C. Wittstein. Fourth edition, much enlarged.

The tendency of the above two works is the same in their aim, to expose the frauds and dangers connected with the manufacture or with the use of the secret or so-called patent medicines. Dr. Wittstein's work was introduced to our readers some years ago, when we published a number of formulas contained in the third edition (see "Amer. Journ. Pharm.," 1871, p. 111). That in less than ten years—the first edition appeared in 1866—four editions have become necessary, proves the usefulness of the work, and that the labor of its editor as a compiler and analyst is well appreciated. The present volume contains the composition of about 800 or more nostrums, cosmetics, disinfectants, etc., the composition of which has been kept secret by the inventors and manufacturers. Amongst that number we find the United States well represented, considering that the volume is in the first line intended to find its field of usefulness on the continent of Europe. There is, however, evidently much room for greater activity in the way of exposing the composition of the numerous nostrums, whether patented or not, with which we are blessed on this side of the Atlantic, and which are imported from the other side to supply any possible deficiency as to variety of style and composition; and we would im-

press the young pharmacists, particularly those who are in quest of subjects for their thesis, not to neglect this promising and important field of original investigation and research.

"The Popular Health Almanac," to which repeated allusion has been made in our last volume, pursues rather a didactic course, by giving useful information on all subjects connected with health matters. In its present garb, it is intended for gratuitous distribution by the pharmacist, whose business card is printed on the cover; but those who would desire to make a nominal charge for it, could, we suppose, have the words, "Presented by," altered to "From." As to the contents of the almanac, we find an admirably written "Introductory," four brief articles on "Applied Health Knowledge," three on "First help in Accidents and Emergencies," and on "Nostrums and their Composition," an enumeration of "Popular works on the subject of health," a number of "Statistical tables," and various other valuable information. Both editor and publisher are deserving of praise for the manner in which this first number has been prepared. May it be the forerunner of a long series of annual publications which, in the beginning, promise to fulfill an important mission in the distribution, among the people, of sound information on the various subjects affecting the health of the individual as well as of the public.

We take great pleasure in recommending both the above works, Dr. Wittstein's book more particularly to those who are familiar with the German language, the "Health Almanac" to everyone of our readers; and it is our belief that the pharmacist engaged in business will be amply repaid for the small outlay incurred in procuring this publication (250 copies for \$10) for the use of his customers. It certainly possesses an intrinsic value which is not found in all the nostrum almanacs combined.

Proceedings of the American Pharmaceutical Association at the Twenty-third Annual Meeting, held in Boston, Mass., September, 1875. Philadelphia: Sherman & Co., printers. 1875. 8vo, pp. 899. Price, in paper covers, \$7.00, bound, cloth, \$7.50.

This is the largest, and we believe also, the most interesting volume issued by the Association, for which it was deemed desirable to use a more calendered paper than for the previous issues. About 460 pages are occupied by the "Report on the Progress of Pharmacy," 70 pages by reports of committees, 180 pages by original papers, and the remainder by the minutes, constitution, roll of members, etc. An excellent likeness of the late Professor Edward Parrish, printed from a steel-plate engraving, and over 60 wood-cuts embellish the work.

The volume is now in the hands of the binder, and will be issued to all entitled during the present month. Copies of it, or of complete sets of the proceedings, may be obtained by addressing the Permanent Secretary, Prof. J. M. Maisch, Philadelphia.

A Text-Book of Human Physiology; designed for the use of Practitioners and Students of Medicine. By Austin Flint, Jr., M. D. New York: D. Appleton & Co., 1876. 8vo, pp. 978.

The completion of the author's large treatise on "The Physiology of Man" has been noticed on page 494 of our volume for 1874; the work before us is a condensation of those five volumes into one, to render it more adapted for the daily wants

of the student and practitioner. It is illustrated by three lithographic plates and 313 woodcuts, many of which are exact reproductions from the works of celebrated investigators. The work will be found a valuable addition to the library of the medical student and practitioner.

The reception of the following publications is hereby acknowledged:

The Chemists and Druggists' Diary for 1876. 4to. It is presented to every annual subscriber of the "Chemist and Druggist."

Transactions of the 25th Anniversary Meeting of the Illinois State Medical Society, held May, 1875. Chicago, 1875. 8vo, pp. 288.

Manitou, Colorado, U. S. A., its Mineral Waters and Climate. By S. Edwin Solly, M. R. C. S. 1875. St. Louis: J. McKittrick & Co. 8vo, pp. 40.

Batley's Operation. By Dav. W. Yandell, M. D., and Ely McClellan, M. D. Louisville, 1875. 8vo, pp. 16. Reprinted from the "American Practitioner," for October, 1875.

Untersuchungen über den Einfluss der Temperatur auf Bakterien-Vegetation. Von Leonid Bucholtz, Stud. Med. Investigations on the Influence of Temperature upon the growth of Bacteria. The experiments were made in Prof. Dragendorff's laboratory at Dorpat.

Cactus, its History, Classification, Proving, and Therapeutical Application. By Rich. E. Kunze, M. D., of New York. Albany, 1875. 8vo, pp. 33. Read before the New York Eclectic Medical Society.

OBITUARIES.

HEINRICH HERMANN HLASIWETZ was born at Reichenberg, Bohemia, April 7th, 1825. After studying chemistry in Jena, he became assistant at the chemical laboratory at Prague, and in 1851 Professor of Chemistry at Insbruck. Subsequently he accepted a call to Vienna, where he labored in a like capacity until the time of his death, which occurred, suddenly, on the morning of October 8th, by apoplexy. The deceased was widely known as an earnest and careful investigator, many of his researches having been undertaken in conjunction with Rochleder.

R. P. CLAYTON, of Dover, Del., died, suddenly, last October, in this city, where he was learning the apothecary business. He was a promising young man, and intended to graduate here next spring. In respect to his memory, his classmates will wear a badge of mourning at the next commencement.

CORRECTION.—On page 536 of our last number, line 3 from top, read *salt* for solution, and on page 563, line 19 from top, read *pr. ct.* in place of pint.

CATALOGUE

OF THE

Class of the Philadelphia College of Pharmacy,

FOR THE FIFTY-FIFTH SESSION, 1875-6.

With a List of their Preceptors and Localities.

<i>Matriculants.</i>	<i>Town or County.</i>	<i>State</i>	<i>Preceptor.</i>
Ahl, William Frank.	York,	Pa.	Dr. David Ahl.
Aisworth, Frank Kenley.	Woodstock.	Vt.	Sturtevant Bros.
Allen, John Reese.	Wilthington,	Del.	James Kemble.
Anstett, Zachary Taylor.	Coopersburg,	Pa.	P. J. L. Carberry, M. D.
Appenzeller, Gustav.	Carlsruhe,	Germany.	R. Opperman.
Armstrong, Thomas Swain.	Phillipsburg,	N. J.	James T. Shinn.
Bache, Benjamin Franklin.	Bristol,	Pa.	Bullock & Crenshaw.
Baker, Walter Sheron.	Philadelphia,	Pa.	James Jones, M. D.
Ball, William Amos.	Youngstown,	Ohio.	J. L. Patterson & Bro.
Barnes, Thomas.	Philadelphia,	Pa.	Mackecown, Bower & Ellis.
Barr, John Rufus.	Chester City,	Pa.	John H. Kerlin.
Barr, Samuel Earnest.	Mount Vernon,	Ohio.	E. P. Camp.
Barton, Charles Edwin.	Mansfield,	Ohio.	W. W. Moorhead.
Baum, Franklin Derr.	Reading,	Pa.	F. M. Zeigler.
Baur, Hugo Franklin.	Milwaukee,	Wis.	C. C. Spannagel.
Behlar, John.	Washington,	D. C.	G. A. Bachmann, M. D.
Bissell, Emery Gilbert.	Waterville,	N. Y.	W. J. Bissell.
Bley, Alphonso Albert Willis	Philadelphia,	Pa.	John Bley.
Bobb, Edwin George.	Holidaysburg,	Pa.	J. Ritz.
Bobb, Wallace Geary.	Philadelphia,	Pa.	V. H. Smith & Co.
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Boerner, Emil Louis.	Iowa City,	Iowa.	Wm. C. Bakes.
Boileau, Wm. Norwood K.	Newportville,	Pa.	Clarence T. Smith, M. D.
Boisnot, Frederick Styker.	Franklin Park,	N. J.	Willard M. Reil.
Bond, Charles Mahlon.	Fort Wayne,	Ind.	C. E. Cady, M. D.
Botsford, Chipman.	St. John, New Brun.	Canada.	Hance Bros. & White.
Bowen, Daniel Albert.	W. Bridgeton,	N. J.	Geo. H. Whipple.
Bowman, Chas. Alexander.	Nashville,	Tenn.	Haddox & Ford.
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Boyer, Hiram.	Bethlehem,	Pa.	F. G. Thoman.
Brennecke, Robert Henry.	Watertown,	Wis.	Samuel Campbell.
Brenton, Willis.	Pittston,	Pa.	Powers & Weightman.
Brotherline, Chas. Augustus.	Lebanon,	Pa.	Francis Zerman, M. D.
Brown, David Howard.	Middletown,	N. Y.	Lancaster Bros.
Brown, George Walbridge.	Jamestown,	N. Y.	A. C. Hembold.
Brown, Joseph John.	Greenville,	Ohio.	Jos. P. Remington.
Buchanan, Andrew.	Chester,	Pa.	M. H. Bickley.
Bullock, John Griscom.	Wilmington,	Del.	Bullock & Crenshaw.
Burge, James Oscar.	Bowling Green,	Ky.	John H. Smith.
Burns, Simon Snowden.	Minersville,	Pa.	Wm. Bowen.
Busch, Wm. Carl Assuns.	Davenport,	Iowa.	Henry Ditzen.
Byerly, Chas. Henry.	Lock Haven,	Pa.	Mortimer H. Eayer.
Cahoon, Charles Thomas.	Philadelphia,	Pa.	W. S. Radcliff.
Carbonell, Louis Phillip.	Santiago de Cuba,	Cuba.	J. P. Remington.
Carmany, Aaron Washington	Annnville,	Pa.	M. L. Gates, M. D.
Carmichael, Henry.	Davenport,	Iowa.	Prof. G. Hendricks.
Case, Flavius Saunders.	Logan,	Ohio.	E. B. Garrigues & Co.
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Chambers, John Roberts.	Burlington,	N. J.	W. L. Jasner.
Chardavoyne, Wm. Simpson.	Hamburgh,	N. J.	A. F. Stull.
Childs, Walter Foss.	Norristown,	Pa.	F. B. Poley.
Cook, Thomas Penrose.	Philadelphia,	Pa.	Powers & Weightman.
Corbyn, Theophilus Niblow.	Milwaukee,	Wis.	Aschenbach & Miller.
Cotzhausen, Louis von.	Burlington,	N. J.	Henry Biroth.
Cowperthwaite, Marshall S.	Philadelphia,	Pa.	John A. Vandegrift.
Cox, Harry.	Philadelphia,	Pa.	Wm. E. Lee.
Cox, John Custis.	Columbus,	N. J.	G. W. Ouram.
Coxey, Joseph Clarence.	Camden,	N. J.	H. W. Miller.
Craighead, Thomas.	Philadelphia,	Pa.	Geo. S. Craighead.

Matriculants.	Town or County.	State.	Preceptor.
Creighton, Benjamin Thomas	Somerton,	Ohio.	D. P. Pancoast.
Crowl, Frank Mercer.	Oxford,	Pa.	Geo. Cook.
Daniel, Charles Albert.	Germantown,	Pa.	D. Augustus Jones.
Davidson, Abraham.	Helmarshausen,	Germany.	G. A. Steer.
Davis, Isaac.	Philadelphia,	Pa.	G. H. Davis.
Davis, Theodore Garrison.	Bridgeton,	N. J.	Chas. F. Dare.
Dembinski, Louis.	Philadelphia,	Pa.	A. Opperman.
DePuy, Casper Edward.	Iowa Falls,	Iowa.	Fister & Hoag.
Dickerson, William Eunice.	Media,	Pa.	Dr. W. T. Dickerson,
Dilg, Philipp Henry.	Milwaukee,	Wis.	Kirst & Gerhardy.
Diller, Isaac Roland.	Springfield,	Illinois.	R. W. Diller.
Dilworth, Edwin Thatcher.	Wilmington,	Del.	L. M. England.
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Emanuel, Louis.	Alleghany,	Pa.	P. Walter, Jr.
Eodicott, John Franklin.	Philadelphia,	Pa.	D. L. Stackhouse.
Evans, John Henry.	"	Pa.	Dr. David Harrison.
Farwell, Charles Darius.	Brandon,	Vt.	C. H. Warren.
Fisher, Henry.	Philadelphia,	Pa.	W. H. Walling.
Fleming, Wm. Fullerton.	Ottawa,	Canada.	Dr. J. A. Cantrell.
Fraser, Robert Peden.	Pictou,	Nova Scotia.	J. D. B. Fraser & Son.
Frishell, George.	"	"	Cramer & Small.
Früh, Ernest.	Philadelphia,	Pa.	Carl D. S. Früh.
Früh, Gustav Adolph.	"	Pa.	"
Fry, Wilbur Winthrop.	Wilkesbarre,	Pa.	
Fulton, Joseph Miller.	New London,	Pa.	
Funk, Christian Lawson.	Hagerstown,	Md.	
Gatchel, Rudolph Edmund.	"	Md.	
Geiger, Geo. Lambert.	Virginia,	"	
Gentsch, Daniel Conrad.	New Philadelphia,	Ohio.	Dr. E. Worrall.
Gerling, John Miller.	Cleveland,	Ohio.	Geo. F. Gentsch.
Gingrich, Ezra Heisey.	Annnville,	Pa.	Vaupel & Hoare.
Goes, Geo. Conrad, Jr.	Philadelphia,	Pa.	Asa Jones.
Graber, Leon Joseph K.	Bethlehem,	Pa.	Val Smith & Co.
Graham, Geo. Harris.	Philadelphia,	Pa.	Hess & Snyder.
Gray, Geo. Washington.	"	Pa.	Israel J. Graham.
Griffin, Louis Franklin.	Houston,	Texas.	Isaac Tull.
Griffith, Charles.	Johnstown,	Pa.	Chas. B. Evans.
Groves, John Dowling.	Philadelphia,	Pa.	C. F. Fraser.
Guckes, Philip.	"	Pa.	Dr. M. F. Groves.
Hallberg, Carl Swante N.	Helsingborg,	Sweden.	S. M. Sellers.
Harris, Chas. Greene.	Davenport,	Iowa.	E. S. Ballard & Co.
Harris, Park.	West Chester,	Pa.	Jos. S. Evans.
Harris, Wm.	Ashland,	Pa.	Robert Howarth.
Hartzell, Alfred Kerr.	Allentown,	Pa.	Henry Hartzell, M. D.
Hayhurst, Henry Tower.	Burlington,	Iowa,	D. B. Colby.
Hendershott, Jos. Newton.	Bloomsburg,	Pa.	N. J. Hendershott.
Herrmann, Ernest Wm.	Philadelphia,	Pa.	H. Frasch.
Higgins, W. R.	Glassboro,	N. J.	Wm. Greene, M. D.
Hill, Edward.	Wilkesbarre,	Pa.	Wordle Ellis.
Holden, George Blake.	Haverhill,	Mass.	
Hooper, Oliver Pascall.	East New Market,	Md.	
Hooven, Wilbur Thos.	E. Mauch Chunk,	Pa.	
Hoguet, William.	Bristol,	Pa.	
Hornberger, Chas. Eugene.	Speier,	Germany.	
Hudgin, Edward Leo.	Galesburg,	Illinois.	C. H. Robinson.
Huntzinger, Jno. Franklin.	Fairfield,	Iowa.	W. H. Wallace.
Huston, Thos. Albert.	Mount Vernon,	Ohio.	Jos. S. Evans.
Jackson, Geo. Henry.	Mahanoy City,	Pa.	Robert Howarth.
Johnson, Jno. Geo.	Minneapolis,	Minn.	Henry Hartzell, M. D.
Jones, Theodosia.	Philadelphia,	Pa.	D. B. Colby.
Kay, Joseph Jr.	Haddonfield,	N. J.	N. J. Hendershott.
Keeney, Wm. Reynolds.	Philadelphia,	Pa.	H. Frasch.
Keller, Alvin Henry,	Rinnersburg,	Pa.	Wm. Greene, M. D.
Keneagy, John.	Bristol,	Pa.	Wordle Ellis.
Kernan, Jos. Halbert.	Carlisle,	Pa.	
Kilbride, Jas. Jackson.	White Deer Mills,	Pa.	
Kimmel, Wm. Alexander.	Sommerset,	Pa.	
Kindig, Isaiah Henry S.	Harleysville,	Pa.	
Kinport, Philip Stein.	Annnville,	Pa.	
Klopp, Eli Leinbach.	Stoudsburg,	Pa.	
Koehler, Otto Fürchtegott.	Greitz,	Germany.	
Koehler, Walter Newcomb.	Germantown,	Pa.	
Kolp, Jacob Loudenslager.	Philadelphia,	Pa.	
Kompel, Robert August.	Bavaria,	Germany.	
Kram, Geo. Washington.	Bethlehem,	Pa.	
Kramer, Howard Samuel.	Allentown,	Pa.	
			Dr. James Fulton.
			H. C. Blair's Sons,
			W. B. Webb.
			Dr. E. Worrall.
			Geo. F. Gentsch.
			Vaupel & Hoare.
			Asa Jones.
			Val Smith & Co.
			Hess & Snyder.
			Israel J. Graham.
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			Chas. B. Evans.
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			E. S. Ballard & Co.
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			Robert Howarth.
			Henry Hartzell, M. D.
			D. B. Colby.
			N. J. Hendershott.
			H. Frasch.
			Wm. Greene, M. D.
			Wordle Ellis.
			C. H. Robinson.
			W. H. Wallace.
			Louis A. Hoguet.
			C. E. Haenchen.
			Isaac W. Smith.
			R. J. Mohr, M. D.
			Caleb R. Keeney.
			E. E. Hazlett.
			C. Smith, M. D.
			Howard Hospital.
			J. A. Braddock.
			Caleb R. Keeney.
			Caleb H. Needles.
			J. R. Hamilton.
			T. J. Husband, Jr.
			Geo. J. Kilbride.
			E. H. Marshall.
			D. S. Wiltberger.
			Clement B. Lowe.
			Samuel Gerhard.
			Chas. W. Gmelin.
			Chas. E. Davis.
			C. Henry Kolp.
			Weatherley.
			Van Buskirk & Apple.
			Martin & Weigner.

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Krogman, Joseph Francis.	Philadelphia,	Pa.	Benjamin Falkenberg,
Krupp, Louis.			
Kuhlman, William.	Bremen,	Germany,	H. Opperman.
Laciar, Henry Jacob	Bethlehem,	Pa.	James T. White.
Lamboter, Edward.	Grand Island,	Nebraska.	C. F. Goodman
Landschütz, Peter.	Philadelphia,	Pa.	Jos. Landschütz.
Lardner, William Shepard.	Philadelpha,	Mich.	Hansell & Bro.
Lashell, Charles Ludwig.	Niles,	Pa.	W. B. Webb.
Latham, Jr., Daniel Henry.	Catawissa.	Pa.	Wm. C. Bakes.
Laver, Philip Jacob.	Philadelphia,	Pa.	John S. Erben.
Laws, Edward Mortimer.	Mansfield,	Ohio.	A. L. Lamb.
Lehman, John Wesley.	Millford,	Del.	Barker, Moore & Mein.
Lewis, Chas. Henry.	Barren Hill,	Pa.	Dr. B. H. Davis.
Lewis, John Jones.	Mahanoy City,	Pa.	Harry C. Fernalter.
Lewis, William Thompson.	Mt. Carmel,	N. J.	Joseph P. Balton.
Linn, Jacob.	Bridgeton,	Pa.	C. H. Kolp.
Lins, Frank Pierce.	Philadelphia,	Pa.	John M. Thomas.
Linthicum, Theodric.	Helena,	Ark.	J. W. Cage.
Lippincott, Charles Drum.	Williamsport,	Pa.	Milton Huber.
Lits, Walter Rulp.	Frankford,	Pa.	E. W. Chipman.
Llewellyn, William Harry.	Phoenixville,	Pa.	E. Frank Stoner.
Lock, John Herman.	Philadelphia,	Pa.	Dr. L. U. Hilderbrand.
Logan, Harry Weaver.	Williamsport,	Pa.	Ellis, Son & Co.
Loper, Lorenzo Dow.	Bridgeton,	N. J.	H. A. Vogelbach.
Louderbough, Frank Pierce.	Dover,	Del.	Jas. L. Shind.
Loy, Edgar Turner.	Morris,	Ill.	I. U. Bean.
Lustig, Emil.	Pittsburgh,	Pa.	J. C. Longe.
McFerren Jeremiah Dull.	Chambersburg,	Pa.	F. G. Williams & Co.
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McMullin, Albert.	Philadelphia,	Pa.	A. M. Wilson.
McMullin, Andrew.	"	Pa.	W. H. Pile & Sons.
McNeil, Robert, Jr.	"	Pa.	John B. Ferguson.
Mackenson, Alonzo Geo.	Middletown,	Pa.	Chas. M. Morell.
Marquardt, Carl Heinrich.	LaCrosse,	Wis.	A. W. Test.
Marshall, Clara.	Philadelphia,	Pa.	Israel J. Graham.
Martin, Geo. Jr.	"	Pa.	A. H. Yarnall & Co.
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Martin, John Chrysostom.	Alleghany City,	Pa.	R. M. Snodgrass,
Mebus, Fred'k Leonard	Easton,	Pa.	D. E. Becker.
Merriut, Joseph Wayne.	Woodbury,	N. J.	Bullock & Crenshaw.
Miller, Sylvester Edwin.	Leighton,	Pa.	N. B. Reber, M. D.
Miller, Wm. Leland.	St. Louis,	Mo.	
Mitsch, George Joseph.	St. Paul,	Minn.	Dreir & Mitsch.
Moenkemoeller, Chas.	Wheeling,	W. Va.	Geo. R. Vernon, M. D.
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Moore, Richard Jesse.	Springfield,	Ohio.	Thos. J. Casper.
Moser, John Hendricks.	Norristown,	Pa.	A. R. Siemmer.
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Murray, Francis Marion.	Bluffton,	Ohio,	Voder & Hauenstein.
Myers, Edwin.	Philadelphia,	Pa.	P. P. Fox.
Oleson, Martin Olaf.	Fort Dodge,	Iowa.	Prindle & Youst.
O'Neill, George.	Philadelphia,	Pa.	Powers & Weightman.
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Parker, Frederick Henry.	Auburn,	N. Y.	John Butler.
Phillips, Jacob Franklin.	Ashland,	Pa.	M. Goldsmith.
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Rosenwasser, Nathan.	Cleveland,	Ohio.	W. H. Spieth.
Ross, David Hamilton.	Philadelphia,	Pa.	Bullock & Crenshaw.

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Schools, George William.	Lebanon,	Pa.	Jas. A. Armstrong, M.D.
Schroeder, Henry.	Chicago,	Illinois.	Gale & Blocke.
Schwartz, Arthur.	Philadelphia,	Pa.	J. J. Cumming, M. D.
Selinger, John Anthony.	Pottstown,	Pa.	John Oddy, M. D.
Semple, George Miller.	Easton,	Pa.	H. B. Semple.
Sheridan, James Henry.	So. Bethlehem,	Pa.	G. C. Boyer.
Shinn, Howard Granville.	Burlington,	N. J.	H. Hutchison.
Sides, Howard Buckman.	Philadelphia,	Pa.	Samuel Gerhard.
Smith, Albert Henry.	"	Pa.	Herm. Vogelbach.
Smith, Clayton Kerper.	"	Pa.	Samuel Campbell.
Smith, Joseph Stahel.	Warren,	Pa.	J. R. Stevenson, M. D.
Smith, William Harrold.	Philadelphia,	Pa.	J. P. Remington.
Sommers, Richard Miller.	Camden,	N. J.	C. M. Schellenger.
Sonnicks, John William.	Buffalo,	N. Y.	Rieffenstahl Bros.
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Spengler, Allen.	Easton,	Pa.	W. Notson, M. D.
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Suess, Paul John.	So. Bethlehem,	Pa.	William Stahler.
Sweitzer, Morris Kemerer.	Bethlehem,	Pa.	Hess & Snyder.
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Tomlinson, Wm. H.	Harrodsburg,	Ky.	B. N. Bethel, M. D.
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Wallace, Ellerslie.	Philadelphia,	Pa.	
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Watson, Charles Henry.	Philadelphia,	Pa.	Wetherill & Bro.
Watt, Harry Calvin.	Indiana,	Pa.	H. C. Blair's Sons.
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Weber, Jeremiah.	Philadelphia,	Pa.	M. Coombs.
Weis, William.	Reading,	Pa.	M. J. Cumming.
Wetser, William Puffer.	York,	Pa.	A. P. Brown.
Werckshagen, Otto.	Philadelphia,	Pa.	C. A. Werckshagen.
Wells, Ebenzer Miller.	Raymond,	Miss.	J. M. Boyle, M. D.
Wetherell, Wm. Henry.	Philadelphia,	Pa.	Wetherill & Bro.
Wheaton, Theodore Corson.	Seaville,	N. J.	Jas. N. Marks.
White, Andrew Allison.	Philadelphia,	Pa.	
White, Hugh.	"	Pa.	Bullock & Crenshaw.
Whiteside, William Elder.	"	Pa.	P. S. P. Whiteside, M. D.
Wicker, Fred. Collins.	Chicago,	Ill.	Geo. O. Guy.
Williams, Luther Thomas.	Centreville,	Md.	H. R. Warner & Co.
Williams, Thomas Davis.	Minersville,	Pa.	J. B. Moore.
Williams, William Chapman.	Havre de Grace,	Md.	E. M. Locke.
Wilson, Alexander.	Philadelphia,	Pa.	John Moffett.
Wilson, James Alexander.	"	Pa.	Powers & Weightman.
Witmer, John Alfred.	Lancaster,	Pa.	S. S. Bunting.
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Wittkamp, Henry Louis von.	Philadelphia,	Pa.	Barker, Moore & Mein.
Woolston, Wm. Norton Shinn.	Mt. Holly,	N. J.	C. H. Dwyer.
Worley, George Melville.	Covington,	Ohio.	Thos. A. Worley.
Wright, Frank Elisha.	Batavia,	N. Y.	
Wright, John Lewis.	Warrenton,	Geo.	J. T. Shinn.
Zacharias, Isidore.	Savannah,	Ga.	J. Lippman & Bro.
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THE AMERICAN JOURNAL OF PHARMACY.

FEBRUARY, 1876.

RAIZ DEL INDICO.

BY RUDOLPH F. G. VOELCKER, PH. G.

(*Abstract from an Inaugural Essay.*)

This name is applied by the natives of Mexico to a plant growing along the Rio Grande, the root of which they use as an astringent. The plant produces fleshy, fusiform roots, several of which grow together from a short head. They are nearly circular, one to two inches in diameter, and about two and one-half to three inches long. The corky bark is covered with a brownish, wrinkled layer, and is separated by a dark cambium line from the pithless internal substance, which is of a yellowish-brown or pinkish color. A transverse section of it shows one or sometimes two yellow concentric rings, and many dark resinous spots, arranged so as to form radiating lines.

A quantity of fresh roots were procured in July, 1874, and several of them planted. In a short time they produced some leaves, which when full grown were petiolate, with a stipule at the base of the petiole, entire, twelve to thirteen inches long by two and one-half to three inches wide, oblanceolate, acute, smooth, shining, juicy and of light-green color. The plants have not flowered yet, and, as I was unable to procure any flowers from Mexico, it was impossible to classify the plant, but from its chemical composition and microscopic structure it might be inferred that it belongs to the natural order of Polygonaceæ.

Treatment with Ether.—The powdered root was exhausted with ether, and the dark-red solution evaporated. Strong ether dissolved nearly all, water only a portion. The residue was of a yellow color, and had but little taste; cold alcohol dissolved a portion of it, the residue consisting of wax, which was partially soluble in boiling alcohol. The solution in cold alcohol, when evaporated left moss-like crystal-

line groups, of an orange-colored principle, which by the following behavior was proven to be *chrysophanic acid*: It was readily soluble in amylic alcohol, ether, benzol, glacial acetic acid and coal naphtha; nearly insoluble in cold water; sparingly in boiling water, imparting to it a reddish color; soluble in sulphuric acid and reprecipitated on the addition of water; soluble in ammonia and the fixed alkalies, with a deep red color. The ammoniacal solution yielded with acetate of lead a lilac-colored and with subacetate of lead a yellow precipitate, the latter becoming carmine-red on the addition of water, and cinnabar-red when dried. The watery solution of the ethereal extract was free from oxalic acid, but contained tannin, which was obtained as a brownish mass by precipitating with acetate of lead, exhausting the precipitate with acetic acid, neutralizing with ammonia, and decomposing the precipitate suspended in alcohol with sulphuretted hydrogen. It was precipitated by gelatin, black by ferric chloride, but did not yield pyrogallie acid.

Treatment with Alcohol.—The root, exhausted by ether, was treated with strong alcohol, the tincture concentrated and then treated with water, which produced a brownish precipitate, becoming black and glossy on drying. Strong alcohol dissolved it in part only, the remaining portion being black and friable, insoluble in water, very sparingly soluble in alcohol, ether, chloroform and benzol, burning upon platinum foil without melting, yielding with alkalies a brown color, and forming oxalic acid when treated with boiling nitric acid. This behavior proves it to be *aporetin*.

The portion soluble in strong alcohol yielded with ether a yellow solution, and a brown, insoluble substance corresponding in behavior with *phaoretin*: when heated it melted and gave off yellow fumes; it is with difficulty soluble in water, coloring it yellow, yields yellow solutions with alcohol and acetic acid, and red-brown solutions with alkalies; its solution in sulphuric acid, when diluted with water, gives a yellow precipitate, and its ammoniacal solution a violet-red precipitate with lead acetate.

The yellow ethereal solution yielded on evaporation *erythreoretin*, which was found to be insoluble in cold water, to become soft and sparingly soluble in boiling water, to melt on being heated, and give off yellow fumes, to yield with sulphuric acid a brown solution which is precipitated by water, to be soluble in alcohol, ether, acetic acid, and with a purple-red color in alkalies from which acids precipitate yellow flocks.

The aqueous solution of the alcoholic extract was treated with acetate of lead. The precipitate contained *tannin*, but no oxalic acid, while in the filtrate *glucose* was proven by Trommer's test.

Treatment with Water.—The root exhausted with ether and alcohol yielded to cold water some *albumen*, a trace of *tannin*, considerable *gum*, but no *glucose*. Boiling water subsequently took up much *starch*.

Treatment with Hydrochloric Acid.—The residuary powder from the above operations was treated with dilute hydrochloric acid, in which, by appropriate tests, the presence of *oxalate of calcium* and the absence of phosphoric acid was proven.

The estimation of tannin was accomplished with a standard solution of gelatin, which indicated 23.16 per cent.

The *leaves* of the plant were found to contain *malic* and *oxalic* acids in combination with lime.

FACTITIOUS BALSAM TOLU.

BY RICH. V. MATTISON, PH. G.

(Read at the Pharmaceutical Meeting.)

Having recently occasion to purchase some Balsam Tolu, a small quantity was ordered of a house well known for the high standard of drugs sent out by them; the article was received in 1½ jars, bearing the label of the house which had placed it in the same.

The sample, upon examination, was found to be of a light brown color, with a pronounced odor of the drug, but in consistence rather softer than as usually met with in the market.

Upon the addition of alcohol to a portion of the mass, it was discovered to be but partially soluble in that menstruum, the drug, upon being washed several times successively with warm alcohol and these washings filtered and evaporated, yielding but 26 per cent. of soluble matter.

To a portion of this residue oil of turpentine was added without any observable effect.

To another portion water was added, and the mixture boiled; with a like result.

To another portion ether was added, the whole slightly warmed, the solution filtered and the residue washed upon the filter with ether, the filtrate, upon being evaporated, yielded 63 per cent. of "a balsam pre-

pared from the bark of *Liquidambar Orientale*," which, upon being treated with hot petroleum benzin, yielded a copious deposit of crystals of styracin upon cooling. The residue upon the filtrate was then examined, and found to consist almost entirely of bark and charred ligneous matter, amounting to nearly 11 per cent. of the drug.

The high price of this article, at present, leads us to be careful in the selection of this drug, the sample under inspection costing \$3.90 per lb, and consisting in greater part, about 75 per cent., of charcoal and a drug costing less than a tenth of the price of Balsam Tolu.

The moral it points is two-fold: First, that wholesale druggists should be careful in selecting drugs, which afterward go to the retail trade or manufacturers, with their label attached. Second, that the retailer must not rely implicitly upon any house offering drugs, but examine for himself such articles as may be offered from time to time, before they are allowed to go into the preparations of the Pharmacopœia. Indeed, a wholesome system of drug garbling is sadly needed before such drugs as are to be found generally averaging the market, are fit for the dispensing counter.

In the present instance, the extreme price only makes it more aggravating to the consumer, yet, doubtless, makes this particular article more tempting to the importer.

Philadelphia, First month 18th, 1876.

THE IMPORTANCE OF GARBLING DRUGS.

BY J. J. BROWN.

(Read at the Pharmaceutical Meeting, Jan. 18th, 1876.)

Among the multitude of little things that, in the aggregate, form our profession, none, I believe, are so generally overlooked as that of the garbling of our drugs. That this is an important duty, I think anyone who doubts will find a convincing proof in going over his own stock of goods, and carefully separating the good from the bad, for no matter what precautions we may take in the selection of drugs, sophistications and impurities are bound to creep in. As a student, I have found this kind of employment particularly interesting and instructive, as it affords a means of becoming familiar with the appearance of drugs and their adulterants that could not be obtained by any number of observations of an isolated specimen. The impression among pharmacists often is, I am sorry to say, to feel that after having made purchases from

none but reliable houses, that our whole duty has been discharged in the selection of material for our preparations and prescriptions ; but this precaution alone will not answer, for there is seemingly a constant tendency in drugs to become contaminated with foreign substances.

Goat-skins and aloes have an almost inseparable friendship for each other.

Rhubarb is sometimes associated with neatly-dusted stones, and though they grind hard, we make them up into extracts and powders, and dispense them under a printed guarantee of purity. Hydrastis and serpentaria experience a sort of endosmosis, and genuine tapioca takes out naturalization papers in New York city.

Not long since, I examined a package of serpentaria (about 2 lbs.), which, to a casual observer, was of remarkably fine appearance, but on a more intimate acquaintance was found to contain not only serpentaria, but also fruit of ground cherry, capsules of an unknown plant, stems and leaves of serpentaria, onion-husks, charcoal, snail-shells, bits of wood, glue, ginseng and gravel. I fear an infusion from such an article would scarcely be in accordance with the letter of the "Pharmacopœia."

In another instance, one pound of sarsaparilla root on being garbled, produced the following medley : nut-galls, matico stems, bay, belladonna and digitalis leaves, paper, unknown bark, straw, ipecac and May-apple roots. Whether such a mixture would heighten the alterative effect of sarsaparilla is exceedingly questionable. How such an aggregation of substances so entirely different could take place, is not a question of difficult solution, when we consider how carelessly the covers of bins, barrels and boxes are adjusted in some of our wholesale houses.

A source of greater trouble than this, is in the fact that drugs are too often collected with seemingly but little regard to the medicinal portion thereof, as for instance, valerian and aconite roots are rarely found with less than 25 per cent. of stems attached, which, inasmuch as they contain no therapeutical virtue, are worse than useless.

Pith of sassafras is occasionally accompanied with a goodly share of the woody structure ; in fact, one specimen which I possess is entirely composed of ligneous matter. Many of the leaves are collected with large quantities of stems and petioles, as in senna, buchu, digitalis, etc. Seeds are very generally found contaminated with stems and seed-vessels. Barks, especially our indigenous ones, are too frequently

found with their inner surface coated with wood and the outer one well protected by inert, dead corky matter.

Our profession is, as a general thing, our source of financial income, and here, again, comes the importance of garbling drugs. You ask, What does Mrs. A. know about dirty and sophisticated drugs, when they are dispensed to her in a handsomely-prepared prescription? I answer, Not anything; but it is not alone from the mysterious liquids that trickle from our retorts, or the brilliant crystals that are born in our evaporating dishes, by which we are to be judged. There is, at the present day, and we may be proud of the fact, a spirit of rivalry among pharmacists as to who shall send out the most elegant preparations; but sparkling tinctures, inviting elixirs and palatial soda-fountains will not blind the eye of our censorious, invalid customer to the dirt existing in a package of gum arabic which has been purchased as a selected article. Cachets de pain and electro-plated dragees will not hide the sand, shells and star-fish that lurk in Irish moss any more than a bottle of palatable cod-liver oil will enhance the flavor of a porridge made from animated oat-meal.

A NEW INK.

BY M. S. BIDWELL.

The French inkstand, sold under the name of Encrier Magique, also called perpetual inkstand, in its most approved form, consists of a shallow japanned metal tray, about five inches in diameter, on which is fastened a receptacle of a flattened globular form, about $2\frac{1}{2}$ inches in diameter and $1\frac{1}{4}$ inches high. On the top is an opening closed by a screw cap, and communicating with a cavity about the size of a large thimble. To use it, a little water is poured into this cavity and the ink is at once ready for use; it is nearly jet black, with a slight purplish tinge, flows beautifully from the pen and is said not to be injured by freezing. When the ink is exhausted, or if it becomes too thick, it is renewed by adding a few drops of water. The excellent quality of this ink, and the extreme convenience of its preparation, make it very desirable; but the inkstands are brought from Europe and are quite expensive, so that some more economical substitute seemed desirable. The rapidity of solution and the fluidity of the ink naturally suggested an anilin compound as the probable coloring agent. Acting upon this suggestion, some of the best anilin black (trade name, Nigrosine), was

procured, and a solution made in the proportion of six grains to the ounce of water, this ratio seeming the most successful after several trials. Cold water dissolves it readily, the solution being ready for use in a minute or two. The resulting fluid resembles very closely that produced in the Encrier Magique, being, perhaps, a little less intense in color; in their other properties the two seem to be identical. At the retail price of the black, the ink would cost about 25 or 30 cents a pint. It is bleached by chlorine, but is unaffected by nitric, hydrochloric or sulphuric acids (the dilute acids of the U. S. P. were used in the trial), and is but slightly blurred by soaking in water. Contrary to expectation, it is found to be unaffected by alcohol, which is said to remove the ordinary colored anilin inks from the paper readily and entirely. Writing, executed with this ink, has been soaked in alcohol four days without appreciable change. These somewhat unexpected results encourage the hope that it may prove less liable to fade, by exposure, than other inks of a similar nature; but further trials, during much longer time, will be necessary to determine this point. The only absolutely permanent inks yet made, aside from the use of acids to carbonize the paper, seem to be those made of lamp-black, or some other form of carbon, India ink being the type of the class. These are valuable for records that are to be kept for centuries, but are undesirable for common use, because they are more or less thick, do not flow readily and clog up the pen with insoluble matter. For ordinary purposes, this nigrosine ink can be recommended as combining, perhaps, more advantages than any other yet tried. It is not expensive, is very conveniently made from portable materials, has a good deep color, flows beautifully, does not corrode steel pens and is not injured by freezing. Unless some unforeseen objection should be developed by further trial, it will win the favor of all who use it. The experience of the many who, like the writer, have been first delighted and afterwards disgusted with the logwood and chromate of potassium ink of Prof. Runge, warns us not to be too sanguine in our expectations, but this nigrosine is certainly well worth a trial. One word of caution, there are many things called anilin black, and many of them are worthless; the kind recommended is called nigrosine.

Elmira, N. Y., December, 1875.

NOTE BY THE EDITOR.—The ink recommended in the above

paper appears to be the same as the one to which reference was made on page 88, of our last volume.

ON A NEW PROCESS FOR PHOSPHORUS PILLS.

BY ELI LILLY.

Finding serious objections to all the processes brought forward for phosphorus pills, I was induced to search for a process which should be at once safe, easily managed, protecting the phosphorus from oxidation during the operation, and insure solubility of the pill when taken into the stomach.

I present the following formula, which I think covers all these points, my opinion being based on the manufacture of many thousands of these pills during the last four or five months, with favorable reports from many pharmacists and physicians.

Take of

Syrup U. S. P.,	260 parts.
Wheaten flour,	340 parts.
Phosphorus,	6 parts.

Weigh the syrup in a stout, sound bottle of sufficient capacity to hold one-fourth more than the amount of syrup used. Place the bottle in a water-bath, and raise the temperature to 150° F. Drop the phosphorus into the warm syrup, and, as soon as melted, close the bottle with a close-fitting cork; take it from the bath, and, holding it upright, give it a gently-whirling motion until the phosphorus is divided into small globules, when it must be violently shaken till cold. Having the flour finely sifted and placed in a mortar, pour in the mixture of syrup and phosphorus, and rapidly form the mass, which, when completed, may be packed down in small, glazed earthen jars, and tin foil placed under the covers to retain the moisture and exclude the air.

Pills made from this mass weighing 1 grain will contain $\frac{1}{100}$ grains phosphorus, and 2 grains $\frac{1}{80}$ grain phosphorus.

A portion of the flour in the above formula may be replaced with extract nux vomica, sacch. carb. iron, etc., if such combinations are to be made, of course observing to mix them in *fine powder* with the flour before adding the syrup.

It is necessary, if *small* quantities are to be made, to return the bottle containing the phosphorus and syrup to the water-bath two or three times during the shaking, before finally allowing it to cool; but with 12 troy ounces or more of syrup it is unnecessary.

The advantages of this process consist in the practically perfect subdivision of the phosphorus at a low temperature, which insures safety with ordinary care, producing a mass easily worked, a pill rapidly dried and firm for coating, with so small an amount of oxidation throughout as to be insignificant. The pills, on being powdered in the dark, exhibit uniform luminosity, showing the thorough distribution of the phosphorus.

Finally, let the operator who proposes to test this process for himself, adhere to the directions I have endeavored to make plain, and I believe he will find, as I have, a simple way out of his phosphorus pill troubles.

Indianapolis, Ind., January 14th, 1876.

SOME FORMULAS OF THE SO-CALLED ELEGANT PREPARATIONS.

BY JOHN W. WATTS.

It is evident to almost every careful observer that a large number of the above-mentioned preparations are not exactly what the manufacturers would have the physicians and druggists to believe, though they may in a measure substitute those preparations which they are intended to represent. It is the opinion of the writer that it is nothing more nor less than a mere imposition to bestow upon preparations names which they are not justly entitled to. Would it not be of more interest to the physician, as well as to the pharmacist, to have these preparations fairly represented, and not displayed with circulars, etc., as if they were patent medicines which some manufacturers seem wont to do? Below will be found a few formulas which are used to no little extent, viz :

Syrup of the phosphates of iron, quinia and strychnia :

Sulphate of iron (pure),	℥iv and grs. 16
Sulphate of quinia,	℥ii and grs. 8
Strychnia,	grs. iv
Phosphate of sodium,	℥viii and grs. 32
Phosphoric acid (dilute),	℥viii
Powdered sugar,	
Hydrochloric acid,	aa q. s.

Dissolve the sulphate of iron and phosphate of sodium each in 4 ozs. boiling water separately, pour together, collect the precipitate and

wash ; dissolve the sulphate of quinia in the same quantity of cold water by the aid of hydrochloric acid, precipitate with ammonia water, collect and wash ; add the precipitates and the strychnia to the dilute phosphoric acid in a mortar, stirring, and dissolve any remaining precipitate with hydrochloric acid, filter, then add sufficient powd. sugar to make one pint.

Syrup of lacto-phosphate of lime :

Phosphate of calcium,	. . . . .	℥iv and 16 grs.
Phosphoric acid (dil.)	. . . . .	℥vii
Lactic acid (dil.),	. . . . .	℥i
Hydrochloric acid,	. . . . .
Sugar, powdered,	. . . . .	ad q. s.

Dissolve the calcium phosphate in 4 ozs. of water with hydrochloric acid, precipitate with ammonia water, collect and wash the precipitate and add it to the dilute lactic and phosphoric acids in a mortar ; triturate, dissolve any remaining precipitate with hydrochloric acid, filter and add sufficient powdered sugar to make one pint.

The *wine of lacto-phosphate of lime* may be made in the same way, by using sherry wine in place of the sugar.

The amount of hydrochloric acid necessary to insure permanent solutions will amount to a little less than 6 drachms in the former and 4 drachms in the latter, though one-half of this quantity would be sufficient to form a solution, but the preparations would scarcely keep longer than two or three months without precipitation, unless the whole quantity of acid be used. From this it will be seen that the amount of hydrochloric acid used will be sufficient, or nearly so, to convert all of the phosphates contained in these preparations into chlorides.

Baltimore, January, 1876.

NOTE BY THE EDITOR.—The formula given above for the syrup of the phosphates of iron, quinia and strychnia differs from Aitken's formula, published in "*Amer. Jour. Phar.*," 1867, p. 178, in containing a somewhat larger quantity of iron and less phosphoric acid. The precipitate occurring in the syrup after some time is ferric phosphate (see "*Amer. Jour. Phar.*," 1867, p. 387), and may be prevented by using a stronger phosphoric acid, or, as suggested by the author, by the addition of a sufficient amount of muriatic acid.

For other formulas for syrup of lacto-phosphate of calcium, we would refer our readers to "*Amer. Jour. Phar.*," 1873, pp. 105, 221 and 234.

NOTE ON FRÖHDE'S REAGENT AS A TEST FOR MORPHIA.

BY ALBERT B. PRESCOTT.

On page 21 (Jan. No.) of the present volume of this Journal, Mr. Wellcome brings to notice and refutes certain preposterous claims made, in St. Bartholomew's Hospital Reports of 1874, for a saturated solution of molybdic acid in sulphuric acid, as a test for morphia, namely : that this reagent distinguishes traces of that alkaloid, when it is directly applied to opium tinctures, lozenges and other mixtures. It certainly should not be taken as evidence of anything in particular, that there should be a lively play of colors, when a *strong* solution of molybdic acid in concentrated sulphuric acid, is brought upon aqueous, alcoholic or saccharine mixtures containing unclassified organic matter. As Mr. Wellcome well explains, a large number of deoxidizing agents reduce molybdic acid to blue compounds (molybdic molybdates). But the experiments which Mr. W. reports fail to sustain the extreme scepticism of his conclusion, that "there is no more need of molybdic acid or molybdates in these test solutions than for the presence of any other blue coloring matter, which will blend with the color produced by sulphuric acid, and produce tints which, while pleasing to the eye, confuse the analyst."

In 1866, Fröhde reported* the identification of morphia by the reagent which bears his name—a fresh solution of five milligrams of sodium molybdate in one cubic centimeter of pure concentrated sulphuric acid (1 part to 368 parts)—a violet color being obtained.

In 1868, Almén, † after investigation, stated that Fröhde's test was much more certain and delicate than any of the old reactions for morphia, except that with iodic acid, and more characteristic than that by sulphuric with nitric acid (Erdmann's).

Kauzmann, in 1869, found ‡ that 0.05 of a milligram of morphia, if pure and solid, could be recognized by this test. Neubauer, in 1870, found § the test delicate and distinguishing for morphia in presence of strychnia. J. H. Buckingham, || in 1873, using a fresh solution of 8

* "Archiv der Pharm.," Bd. 126, p. 54; "Zeitschr. f. anal. Chemie," v, 214.
 "Proc. Am. Phar. Asso.," xv, 241.

† "Neues Jahrbuch f. Pharm.," Bd. 30, p. 87. "Zeitsch. f. anal. Chem.," viii, 77.

‡ "Zeitsch. f. anal. Chemie," viii, 105.

§ "Zeitsch. f. anal. Chemie," ix, 241.

|| "Amer. Jour. Phar.," xlv, (1873) 149; "Polytechn. Notizblatt" (1874), 77; "Chem. Cent." (1873), 797; "Jour. Chem. Soc." (1874), 715; "Zeitsch. an. Ch.," xiii, 234.

grains ammonium molybdate in 2 drachms sulphuric acid (1 part to 15), extended the results, positive and negative, by this test to over twenty alkaloids and glucosides. And, about the same time, Dragendorff, using fresh solutions of 1 milligram sodium molybdate in one cub. cent. of concentrated sulphuric acid (1 part in 1840 parts),* obtained and reported results, positive and negative, with 50 alkaloids and glucosides.†

For morphia, Dragendorff names Frøehde's test first.‡ In his very valuable "*Untersuchungen*," ii, 233, Hager gives a table of the reactions which Dragendorff determined, using the 1 to 1840 molybdic solution. I know of no better authority in proximate analysis than the indefatigable Dorpat professor Dragendorff. His thorough research in the *separation* of alkaloids gives good assurance of the *purity* of those with which he experiments. For my own satisfaction, I have tried the larger number of the tests he reports with Frøehde's reagent, and I have found his results verified with all that I have tried.

It is very true that *the reduction of molybdic acid* produces blue products of various shades (hydrated molybdic molybdates), and also by further reduction a brown product (molybdic hydrate) and that numerous reducing agents—inorganic and especially organic—effect these reductions. Indeed, a solution of molybdic acid in sulphuric acid is deoxidized to a blue precipitate by heat alone, at the temperature of incipient vaporization of the sulphuric, that being an approved test for molybdenum.§

Now a large proportion of the most certain tests for organic compounds are made by application of oxidizing agents which serve to reveal the reducing power of these compounds: the degree and kind of the reducing power being within certain limits characteristic of each reducing agent tested for. Trommer's test for sugars, the "fading purple" test for strychnia, and the "thalleioquin test" for quinia, are examples: the old tests for morphia by nitric and iodic acids, and probably that by ferric chloride, are of the same kind. In the greater number of these tests, chemists have not ascertained what are

* For "0.01 grain," at middle of page 22 this vol. of this Journal, read "0.01 gram."

† "Beiträge zur gericht. Chemie einzelner organischer Gifte," St. Petersburg, 1872.

‡ "Die chem. Werthbestimmung starkwirkender Drogen," p. 81.

§ Schön: "Zeitsch. f. analyt. Chemie," viii, (1869), 379.

the organic products of the oxidation, and this has been the case with some so definite as to have a quantitative application (such as the use of the potassic cupric tartrate). No one of these tests is good for anything unless applied to carefully classified material. Thus, Frøehde's reagent is directed to be applied to alkaloids, "absolutely free from impurities, not alkaloids." Salts of alkaloids with acids which, liberated by the sulphuric acid, will act as oxidizing, or reducing, or coloring agents, are, of course, unsuitable forms for the test. So it is not strange that Mr. Wellcome obtained the colors he names, with bromide, iodide, ferrocyanide and tannate, of quinia.

The *extreme dilution of the molybdic acid* in Dragendorff's use of Frøehde's reagent, shows the intensity of that elective reducing power possessed by some alkaloids, and renders this form of the reagent much more reliable than the form used by Buckingham (the strength first proposed by Frøehde, being intermediate). Stannous chloride solution quickly colors ordinary molybdate solutions blue, but this and most other inorganic reducing agents fail to affect the solution when it is of the strength that Dragendorff uses.

There yet remains to consider a statement in Mr. Wellcome's paper, concerning a point of much importance in the identification of morphia, a point having some practical relations generally overlooked. Referring to the table of reactions with Frøehde's reagent given in "Outlines of Proximate Organic Analysis," and to the statement there that *morphia with concentrated sulphuric acid alone is colorless*, he reports that "it gives a wine-red color." If the latter statement is correct, it certainly greatly weakens the evidence of the violet color obtained when the trace of molybdate is present. And, if my reader leaves this discussion to try the test for himself, with the first materials at his hand, he may, probably, find in a few minutes the result (even in the cold) which Mr. Wellcome found. If so, and he is sure that his sulphuric acid is absolutely pure, and his morphia or its sulphate pure, so much the worse for Frøehde's reagent and its authorities; while, if he is not sure of the absolute purity of his materials, the result suggests caution in use of the test, and inquiry as to *impurities and their influence*.

The *authorities* are nearly uniform in the statement that morphia is not colored by concentrated sulphuric acid (in the cold and without

standing). In the hand-books, Fresenius,* Otto,† Wormley,‡ Heppe,§ and others, agree in this,—Wittstein, on the other hand, giving as result a yellowish coloration.|| Hager¶ and Heppe, (as just quoted)—both as compilers—state that, by heating the sulphuric acid solution to 100° to 150° C., a “faint violet-red” or “red” color is obtained.

A trace of nitric with sulphuric acid greatly effects its reaction with morphia,—a mixture of the two acids furnishing a much more delicate test for that alkaloid than nitric acid alone. In 1861, Erdmann, during some fruitful researches in the identification of alkaloids** fixed upon a mixture containing little more than one hundredth of one per cent. of nitric acid of spec. grav. 1.25,†† referred to as Erdmann's reagent giving with morphia a violet color. Now how minute a trace of nitric acid will enable sulphuric acid to color notable quantities of morphia reddish, I do not know. As to the purity of the “chemically pure” sulphuric acid of the market, most analysts find occasionally lots which reveal nitric acid, even by the ferrous sulphate test, and, still more often, the brucia test or the anilin sulphate test shows the impurity.‡‡ Query: how does the delicacy of a morphia test for nitric

* “Qual. Chem. Anal.,” Johnson's Edition from 14th German, (1875), p. 392.

† “Detection of Poisons,” New York, 1862, p. 146.

‡ “Micro-Chemistry of Poisons,” (1869), “Tabular View.”

§ “Die Chemischen Reactionen,” Leipzig, 1875, p. 246.

|| “Analyse v. Pflanzen u. Pflanzentheilen,” 1868, p. 156.

¶ “Untersuchungen,” ii, 161.

** “Annal d. Chemie u. Pharm.,” Bd. 120, p. 188. “Zeitsch. f. analyt. Chemie,” i, 224,—(Neubauer's Report).

†† Six drops of nitric acid of sp. gr. 1.25 are mixed with 100 c. c. water, and ten drops of this mixture are mixed with 20 grams concentrated sulphuric acid. Of this reagent, 8 to 20 drops are added to 1 or 2 milligrams of the solid to be tested, and after $\frac{1}{2}$ to $\frac{1}{4}$ hour the color is noted. The heat developed by a drop or two of water increases the delicacy of the reaction—a violet color. Erdmann reported color tests by this reagent with four other alkaloids, viz.: narcotina, strychnia, brucia and veratria.

Shortly after the introduction of Erdmann's reagent, Husemann (“Annal. d. Chem. u. Pharm.,” Bd. 128, p. 303) ascertained, that if the sulphuric acid solution of morphia (colorless, he states, in the cold) be heated above 100° C. but not as high as 150° C., and then treated with a few drops of nitric acid of sp. gr. 1.2, a dark violet color will give evidence of morphia, the test being more delicate than Erdmann's, revealing 0.00001 gram alkaloid. This test of Husemann is given in the recent manuals of Fresenius, Hager and Heppe.

‡‡ BEDFORD: “Proc. Am. Phar. Asso.,” 1874, 429. DICKINSON: (Contributions Chem. Lab. Univ. Mich.) “Am. Chemist,” 1875, Aug., p. 43.

acid in sulphuric acid compare with the delicacy of tests in use for that purpose?

I have not made any investigations toward the answer of this query, and therefore am not prepared to report as to the effect of absolutely pure sulphuric acid upon morphia. I have found that the best obtainable *sulphuric acid* of the chemical market, with the purest *morphia* easily obtained (purified, as presently to explain), give in the cold but a barely perceptible shade of dull reddish color,—the tint being too faint to clearly define. But all of these samples (taken dry, of course), when heated on the water-bath, promptly turn perceptibly violet or purple—and after standing, become brown. With some samples of sulphuric acid the shade is some lighter than it is with others, but the color of the faintest shades obtained can be defined well enough.

On the other hand, some of the samples of *morphia* which I have tried give (after the heating) a little different color from others, varying from light violet (or rose) toward the purple, though the shade is of nearly the same depth with all the *morphia* samples. But the samples of *morphia* sulphate as found in the market, gave a little more color with the sulphuric acid in the cold than is reported above. Before those results were obtained, the samples of sulphate were dissolved in a little water, the solution washed in a test tube, once, with the best chloroform, and the water solution evaporated to dryness, when the cold residue was tested. I have not investigated the chloroform extract: to do which doubtless larger quantities should be used. Several laboratory preparations of the base *morphia*, and a P. & W. sample of “*morphia*, pure,” taken without purification, gave with sulphuric acid in the cold the nearly negative result above stated. It will be recollected that a number of the opium alkaloids are reported to give bright colors with sulphuric acid. *Papaverina* is colored deep violet, according to Merck; only after heating, according to Hesse*. *Narcotina*, according to Dragendorff, is colored yellow after a few moments' contact, later turning reddish yellow; according to Husemann, after warming, purple. *Thebaina*, (Dragendorff, Hager's *Untersuch.*) gives a blood-red color; (according to Couërbe, a blood-red color when the sulphuric acid contains a trace of nitric). *Narceina* was given in my *Prox. Org. Anl.* as presenting with sulphuric acid a brown to yellow color, after Dragendorff and Wormley; in Hager's *Untersuchungen*, p. 172, the statement is given that the deep-red

* “Heppe's Chemische Reactionen, p. 267.

color, to blue color, usually obtained, is due to impurity. *Cryptopia* gives a blue color. Now from water solution of sulphates, chloroform dissolves and extracts papaverina, narcotina and thebaina, (narceina?),—leaving the morphia in the water solution.

In connection with the inquiry as to the effect of concentrated sulphuric acid upon morphia, it is interesting to note the remarkable power which cane sugar has, as a third body, in this reaction. Schneider's test* gives a purple-violet color of such intensity that it is not exceeded in delicacy by any other test, (others being probably more characteristic). As to the organic products of these reactions, having stated that chemists were generally unacquainted with the products of oxidation of organic compounds as they occur in the "color tests," I ought to refer to at least one research upon morphia, doubtless in the direction of the light desired. C. R. A. Wright has not labored so patiently among the alkaloids, in the service of synthesis, without some benefit to analysis, as well. Thus, he gives the formula (not fully confirmed) of the blood red liquid formed by action of nitric acid and silver nitrate upon morphia, as $C_{24}H_{20}N_3O_{13}$.†

University of Michigan, January, 1876.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Examination of Olive Oil.—E. Kopp calls attention again to the following simple method, which depends upon the conversion of the oil into solid elaidin by means of nitrous acid. Ten volumes of the oil and one volume of ordinary nitric acid are poured into a test-glass, and a few pieces of copper wire are added, whereby nitric oxide is evolved, which, with the nitric acid, yields nitrous acid. As soon as the gas bubbles passing through the oil become numerous, the acid and oil are intimately mixed by stirring with a glass rod. After about five minutes, the mixture is again made by continuous stirring, and then set aside in a cool place of 12° to 15° C. (54° to 59° F.) The oil separates again from the acid, with a blue color from the presence of copper nitrate, but soon begins to congeal, the more rapid in proportion to the purity of the olive oil, the elaidin being not only solid, but like—

* "Am. Journ. Phar.," xlv, (1873), 545; xlv, (1874), 558. "Zeitsch. f. analyt. Chemie," xii, (1873), 218.

† "Jour. Chem. Soc.," 1873, p. 1088.

wise quite white. If mixtures with other oils are thus tested, solidification will take place much slower, and the elaidin will be usually soft, and of a more or less yellowish or brownish color.—*Chem. Centralbl.*, 1875, No. 47, from *Musterzeitung*.

Removal of Silver Stains from Clothes.—The following method is particularly successful with clothes that had been previously washed. The soiled piece is for a few minutes immersed in a concentrated solution of chloride of copper, and the stain is then rubbed with a crystal of sodium hyposulphite, previously dipped into ammonia which has been diluted with an equal bulk of water. If the copper chloride has been quite neutral, the color of the fabric will not be affected. This process may, if necessary, be repeated several times.—*Ibid.*, No. 48, from *Phot. Arch.*

Quercitrin and Quercetin.—Jul. Loewe has experimented with quercitrin prepared by himself from quercitron bark, and found it not to be a glucoside, as usually assumed. He found the formula of quercitrin dried over sulphuric acid to be $C_{15}H_{16}O_9$; when fused at $130^{\circ} C.$ ($266^{\circ} F.$), it was $C_{15}H_{14}O_8$; the yellow lead compound had the formula $C_{15}H_{14}O_8PbO$; the orange-colored lead compound, the formula $C_{15}H_{12}O_7 \cdot 2PbO$, and the formula of quercetin was found to be $C_{15}H_{12}O_7$. The latter is therefore quercitrin from which the elements of water have been removed, and robinin and rutinin are probably quercitrin combined with water; the analyses of the last-named compound, by various authors, agree well with the formula $C_{15}H_{18}O_{10}$.—*Zeitschr. f. Analyt. Chem.*, 1875, 233–241.

To Detect Free Hydrochloric Acid in the Presence of a Chloride.—J. Löwenthal boils the liquid with peroxide of lead, which becomes lighter in color, chlorine being liberated, and the reaction completed in five minutes. Peroxide of lead does not act upon the chlorides having the formula MCl , nor upon pure aluminic chloride; but ferric chloride is strongly acted upon and stannic chloride is completely decomposed by boiling with lead peroxide.—*Ibid.*, p. 306.

Detection of Resin in Wax.—Recently several apothecaries and druggists of Berlin were cheated with beeswax which had been adulterated with 20 per cent. of resin. The specific gravity of pure wax being between .960 and .963, it will float in officinal ammonia water (spec. gr. .960,) while a sample adulterated with resin will sink in the same

liquid, the resin having a higher specific gravity.—*Phar. Zeitung*, 1875, No. 102.

Salicylate of ammonium is recommended by Martenson for internal use. It is readily prepared by neutralizing salicylic acid diffused in water, with ammonia or carbonate of ammonium, whereby a solution of any desirable strength may be obtained. Evaporated upon a water-bath, some ammonia escapes, and the liquid becomes acid; if sufficiently concentrated, and, if necessary, again neutralized, the salt will crystallize, on cooling, in shining needles, which are readily soluble in water and alcohol. The aqueous solution keeps unaltered for a long time, has a sweetish, insipid taste, and, when mixed with mineral or organic acids, deposits salicylic acid. The salt is given dissolved in aromatized water, or in the form of syrup; combination with fruit-syrups must be avoided.—*Ibid.*

Detection of Carbolic Acid in Oil of Cloves.—Jacquemin recommends to add to the oil the fraction of a drop of anilin, and then to shake it with 5 to 6 times its quantity of water, to which subsequently a few drops of chlorinated soda solution are added. Pure oil of cloves will produce a purplish-violet color, which gradually becomes fainter; in the presence of carbolic acid a bright-blue coloration is produced in a few minutes, if agitation is avoided after the last addition. One per cent. of phenol may thus be detected in one drop of the oil.—*Ibid.*, from *Jour. de Phar. et de Chim.*

Preparation of Emulsions of Gum Resins.—The difficulty of preparing emulsions of ammoniac and other gum resins during the summer time, is overcome, according to E. Gasser, by manipulating as follows: 2 or 4 grams of ammoniac are triturated in a mortar as well as possible; then 2 grams of water are added, and afterwards 2 grams of alcohol. The latter is ignited, and when the flame is extinguished 2 grams of powdered gum arabic are added to the warm mixture, and the whole rapidly agitated, after which the emulsion is finished by the gradual addition of the excipient. The above is a modification of the process proposed by Oppermann in his "*Cours de Pharmacie.*"—*Ibid.*, No. 103, from *Jour. de Phar. d'Als.-Lorr.*

Glycerol of Tar.—Ch. Peyronnet obtains a perfectly homogeneous preparation, of the consistence of an ointment, by operating as follows: 5 grams of starch are well mixed with the same quantity of water;

30 grams of glycerin are added, and the mixture is heated, with constant agitation, until it has acquired the proper consistence, when 10 grams of purified tar are added and well mixed.—*L'Union Pharm.*, 1875, p. 324.

Cauterizing Pencils of Sulphate of Copper.—Schoull reduces the crystals of copper sulphate to a coarse powder, which is heated in a porcelain capsule to about 150° C. (302° F.). When it has lost nearly all its water of crystallization, the heat is discontinued and the mass allowed to cool somewhat; it is powdered finely and the water again added in small quantities, and well incorporated with the aid of a pestle. On combining again with its water of crystallization, the salt becomes hot, and finally acquires a pilular consistence, when it is rolled out into cylinders of suitable thickness, which gradually become quite hard. Should the water have been added somewhat in excess, the addition of a little finely powdered effloresced copper sulphate will impart the necessary consistence.—*Ibid.*, p. 326. (See, also, *Amer. Jour. Phar.*, 1875, p. 267 and 504.)

Collodion for Freckles (Collodion antéphélique).—In place of mercuric chloride and cyanide, which are usually recommended for the removal of freckles, the "*Phar. Zeitschr. f. Russl.*" recommends the following preparation, as being effectual without possessing the dangers of the former: One gram of sulphocarbonate of zinc is reduced to a very fine powder, and then incorporated by trituration with one grain of essence of lemon (or other flavor); 5 grams alcohol and 45 grams of collodion.—*Ibid.*

THE PHARMACY OF SALICYLIC ACID.

BY M. MAURY.

The author, who is a pharmacien residing at Lyons, has made a compilation of different formulæ for the administration of salicylic acid, which he read before the Pharmaceutical Association of that city at its October meeting. The paper is published in the "*Répertoire de Pharmacie*" (Oct. 25, p. 609), and we are indebted to it for the following extracts:

External use.—Dr. Wagner recommends that a thin layer of finely powdered salicylic acid should be spread upon calico and applied by means of a bandage to wounds.

Pommade.—Dr. Wagner gives the following formula :

Salicylic Acid	15 parts.
Alcohol	30 "
Lard	150 "

It is important to use the alcohol as a solvent, the direct mixture of the acid with the lard does not give the same good effects.

Dentifrices.—M. Paulcke, a pharmacien at Leipzig, prepares as a dentifrice a powder in which salicylic acid is incorporated; also an "élixir dentifrice," from a solution of the acid aromatized with oil of wintergreen.

Foot Powder.—It is stated that salicylic acid removes the odor of sweat from feet, without preventing the sweating, its action being to prevent the formation of butyric, valerianic and other acids of the same family, which injure the feet. M. Paulcke therefore prepared with salicylic acid, soap, talc and starch, a powder for the feet, which, whilst rendering them firm, is said to induce an agreeable softness and to remove all unpleasant smell.

Mixture.—The following formula is attributed to Professor Wunderlich :

Salicylic Acid	1 gram.
Oil of Sweet Almonds	20 "
Gum Arabic	10 "
Syrup of Almonds	25 "
Orange Flower Water	45 "

A teaspoonful to be taken every hour when children are sufficiently old to use a gargle. Dr. Fontheim says it may be so administered every hour.

Solution in Glycerin and Water.—M. Muller, a pharmacist at Breslau, gives the following :

Salicylic Acid	1 gram.
Glycerin	20 "
Distilled Water	80 "

First treat the acid with the glycerin, and then add the water.

In Switzerland, salicylic acid has been used in typhoid and paludian fevers, etc. It has been noticed that it has a very remarkable cumulative action; for, after having obtained the desired remission by a first dose of 4 to 8 grams, it has been found that a dose of one-half, or one-fourth that quantity on the following days is sufficient to keep the temperature within good limits. Dr. De Cernville recommends that these doses should be administered in water, flavored with liquorice juice.

The following formulæ are due to M. Maury.

Antiseptic Mouth Paste.

Rectified Salicylic Acid	2 grams.
Honey	34 "

Compound Powder for Extemporaneous Antiseptic Mouth Paste.

Rectified Salicylic Acid	2 grams.
Powdered Sugar, or some other inert powder	20 "

Mix. To be applied to the sore parts of the mouth by means of a brush previously moistened with water.

Lozenges.—Salicylic acid, with sufficient gum and sugar for each lozenge to contain 25 milligrams of the acid.

Salicylic Syrup.—Pure salicylic acid, with sufficient syrup of orange flowers for 20 grams to contain 5 centigrams of the acid.

Mixture.

Pure Salicylic Acid	1'50 grams.
Powdered Gum Arabic	10'00 "
Sugar	10'00 "
Orange Flower Water	20'00 "
Distilled Water	100'00 "

F. s. a.—Shake the bottle before each dose. A teaspoonful every two hours for children.

Salicylic Wine.

Pure Salicylic Acid	2 grams.
Muscat Wine	100 " F. s. a.

Wine of Cinchona and Salicylate of Quinia.

Calisaya Bark	30 grams.
Salicylate of Quinia	1 "
Madeira Wine	1000 " F. s. a.

Injection.—A solution of 1 part of salicylic acid in 300 parts of water has been used as an injection in fluor albus.—*The Pharm. Journ. and Trans.*, November 13, 1875.

PILL COATING.

BY F. M. GOODMAN.

We all dislike the modern method of keeping a full line of ready-made pills on hand, comprising from 200 to 250 different formulæ; not only this, but we must be able to dispense pills of A, B and C's manufacture, according to the notions of the physician, necessitating the carrying of an immense stock, some of which remains on our shelves a long time before being called for a second time. Apparently, the

only way of avoiding and abating this nuisance, is to be able to coat the pills ourselves, and do it as nicely as the manufacturers.

Having tried a great many experiments in coating pills with sugar and French chalk, my experience may be of interest and benefit to the readers of "The Pharmacist."

In coating with sugar, I find it advantageous, though not necessary, to coat the pills first with a resinous substance; for this purpose I prefer mastic, as it is not sticky when drying. Pills, when thus protected, may be washed if necessary, to remove a subsequent coating not successfully applied.

To apply this resinous coat, take a patch box, or earthen jar of convenient size, moisten the inside of box and cover with glycerin, introduce the pills, and for every hundred of pills add ten drops of a saturated solution of mastic in ether, adjust the cover, and rotate very rapidly for a few moments, then scatter the pills thinly over a plate of glass that has been previously rubbed with glycerin; when dry, if not thoroughly coated, return to the box and proceed as before; if satisfactory, moisten with mucilage of gum arabic—I part gum to 5 of water—care being taken not to use too much mucilage, yet the pills must be thoroughly moistened; this can be quickly done by placing the pills in the box used for coating, dropping the mucilage upon them, and rolling them around till moistened; then transfer to another jar or box containing dusted sugar (known as confectioners' sugar), here the pills are rolled around with the fingers, using a gentle pressure; when covered, roll them around in a fine sieve to remove the superfluous sugar, then transfer to a clean damp box or jar, rotate rapidly, avoiding a throwing motion; if the coating does not become smooth, again dampen the box or jar, and rotate as before, observing not to let the coating become dry till smooth. It will probably take some practice to be able to obtain an even, white coating.

French chalk, as a coating, was suggested fully fifteen years ago. In the "*Am. Journ. Pharm.*," 1874, Mr. Cope calls attention to it again, and gives very simple instructions for its application, as follows:

"Moisten the pills with mucilage and transfer to a gallipot containing the powdered chalk; when thoroughly coated, turn into a pill-tray and let them remain a short time; they are then put into another gallipot to polish and shake off the loose powder."

For coating pills extemporaneously, I generally make them very moist with mucilage, so that they will absorb a thick coat of chalk;

when well covered they are gently rotated in a clean 4 ounce patch box. As the quantity of mucilage used was sufficient to keep this coating quite soft and moist, a quantity of dusted sugar is added, and the agitation continued. This gives a sugar-coated pill, very white and smooth, and is easily done.

In coating pills with French chalk, in order to have a good coating, care should be used in selecting the chalk; only fine, white pieces should be taken. These can be readily powdered by rubbing on fine sand-paper tacked to a smooth board. It should be sifted through a very fine sieve. The commercial powder is dark-colored and gritty, thus rendered unfit for coating.

In making and coating our own pills, there is not only the satisfaction of knowing that they are correctly made and contain what the label calls for, but the difference in cost will amply repay one for the time he may spend upon them. Thus, pills of iodoform and iron, of 1 grain, quoted at one dollar per hundred, net, can be made for thirty-five cents; compound pills of quinia, quoted at ninety-three cents per hundred, can be made for sixty cents; 5 grain blue mass pills, quoted at twenty-five cents, can be made for eight cents, etc. This difference in cost alone ought to induce dispensing pharmacists to prepare their own pills, then the wholesale pill makers might go on making their elongated, compressed or any other pill that pleases them.—*The Pharmacist*, January, 1876.

EXTEMPORANEOUS COATING OF PILLS.

BY A. F. W. NEYNABER, NEW YORK.

Why can pills, as they are made in the retail prescription department, not be coated there also with sugar, gelatin or some such-like substance?

They can easily be coated with gelatin, according to the directions given in the old edition of "Griffith's Formulary," (also third edition, p. 643), or in "Wood and Bache's U. S. Dispensatory," 12th or 13th edition, with a little experience of the pharmacist.

Pills can also be coated in the retail prescription department with sugar.

The success in coating pills rests chiefly with the first process in mixing the mass. The state of dryness of the pills has the most influence on the operation of coating with sugar as well as with gelatin, and pills can be *thoroughly* dried only if they have been prepared with the

proper excipients. Here we come to the most important part in making pills, the excipients used. The success of the "manufacturer" of pills is mainly due to the employment of the proper excipients, enabling him to dry the pills thoroughly.

A pill may be soft and yet be not as soluble as a hard pill. If we have gum-resins or resinous extracts, and add a little spirit we will produce a pill of softness and plasticity, but when we take such a pill between our fingers and try to mix it with water, we will find that it may adhere to the skin, and cannot be well washed off without using alcohol or some other solvent of resin. On the other hand, if we take compound cathartic pills, prepared strictly as the "United States Pharmacopœia" directs, by using the different substances in the form of powders, and having beaten them into mass with water, we shall have a pill which will fall into powder again when put into water. The excipient should be such as will not *combine* much with the resinous or other ingredients, but form rather a *layer* between the powders employed. A layer of soluble substances between powders less soluble in water (such as gum-resins or resinous extracts), will produce a pill that can be dried to become perfectly *hard*, and yet that will fall into powder when put into water, the water washing out the layer. Soft pills are apt to lose shape; and pills containing moisture cannot be kept in well-closed bottles, lest they become mouldy.

The success in making pills is based on the excipient used.

Pills which have been thoroughly dried can be coated with sugar, as follows: Boil 32 ounces of best white sugar, with $12\frac{1}{2}$ ounces of distilled water, to a syrup, and use enough of this syrup (temp. 120° to 150°) to moisten the pills, in a small copper kettle or pan, exposing it to a heat sufficient to dry the pills while kept in motion and worked with the hand. After this first coat is dry, the operation is repeated until the pill is covered with sugar sufficiently. A very soluble coating for pills is the following composition: 1 ounce of flaxseed, $\frac{1}{2}$ ounce of Irish moss; boil with 8 fluidounces of water, strain, add 4 ounces of sugar, boil and use in the same manner as a solution of gelatin is used for coating pills.

If pills in very small quantities are to be made and coated with sugar or gelatin, in a retail prescription department, the mass should be made as *hard* as it possibly can be made, and allow cutting; after being cut it should be exposed to a draft of dry air so long as time will allow. Thus pills can be made and coated in small quantities within an hour or less time.—*Druggists' Circular*, January, 1876.

DETERMINATION OF MIXED OILS.

The testing of mixed oils is far from being a certain operation. The following, however, are the principal means of determining the presence of mixtures :

1st. The determination of its specific gravity at 15° C. and its comparison, with the following table :

	Density.	Degrees on alcoholometer.	Weight of 1 hectolitre.
Tallow oil (olein)	900'3	73'0	88'40
Colza (winter strained)	915'0	59'8	91'50
Colza (summer strained)	916'9	59'8	91'67
Rape-seed (winter strained)	915'4	59'5	91'54
Rape-seed (summer strained)	915'7	59'2	91'57
Groundnut (Arachis oil)	917'0	58'5	91'70
Olive	917'0	58'5	91'70
Almond	918'0	58'0	91'80
Beechnut	920'7	57'5	92'07
Sesame	923'5	56'0	92'35
Whale	924'0	55'0	92'40
Poppy	925'3	54'5	92'53
Hemp-seed	927'0	53'5	92'70
Cod-liver	927'0	53'5	92'70
Cotton-seed	930'6	52'0	93'06
Linseed	935'0	50'0	93'50

2d. Chlorine turns animal oils brown and vegetable oils white. The former are soluble, and the latter insoluble in ether.

3d. To discover an adulteration by oil of sesame, shake five grams of sulphuric acid with five grams of nitric, and ten grams of the suspected oil ; if mixed, a grass-green color is immediately developed.

4th. To find if olive oil is mixed with any unknown oil, mix fifty centimetres of the oil with ten centimetres of sulphuric acid. If the olive oil is pure, there will be a rise of 42° ; if mixed, the temperature will be 58° for oil of colza, 65° for beechnut, 68° for sesame, 98° for hemp-seed, 13° for linseed.

5th. The production of a black hue in the lower part of the test-tube, after agitating twenty drops of an alcoholic solution of nitrate of silver with ten grams of oil and twenty grams of ether, the flask being kept in the dark, shows the presence of rape-seed oil.

6th. The most difficult adulteration to be detected is that of olive and groundnut oil. These oils have the same density, congeal at the same temperature, and are acted on by sulphuric acid in a similar manner. They can, however, be distinguished as follows :

Dissolve, cold, twelve grams of mercury in fifteen grams of nitric acid of 38° . Mix this with ninety grams of the suspected oil, and agitate often during two hours. If the olive oil is pure, the mixture will become homogeneous; if not, and especially if the mixture becomes filled with carboniferous streaks, the presence of the groundnut oil may be reported.—*Moniteur des Produits Chimiques*, from *Jour. Ap. Science*, 1875, December.

THE GROWTH AND USES OF BENZOIN.

The benzoin, or frankincense, in commercial parlance called “Benzamin,” is a more common article of commerce than camphor. Although in general request for the ceremonies of the Romish, Mahomedan, Hindu and Chinese worship, there is no evidence that the Greeks or Romans, or even the early Arabian physicians, had any acquaintance with benzoin; nor is the drug to be recognized among the commodities which were conveyed to China by the Arab and Persian traders between the tenth and thirteenth centuries, although the camphor of Sumatra is expressly named. The first mention of benzoin occurs in the “Travels of Ibn Batuta,” who, having visited Sumatra during his journey through the East, A.D. 1325–49, notes that the island produces *Java Frankincense* and camphor. There is no further information about the drug until the latter half of the following century, when it is recorded that in 1461 the Sultan of Egypt sent to Pasquale Malipiero, Doge of Venice, amongst other articles, a present of 30 *rotoli* of *Benzoi*. Agostino Barberigo, another Doge of Venice, was presented in similar manner, by the Sultan of Egypt, with 35 *rotoli* of aloes wood, the same quantity of *benzin*, and 100 loaves of sugar. The occurrence of benzoin in Siam is noted in the journal of the voyage of Vasco de Gama, and the Portuguese traveler Barbosa, who visited Calicut, on the Malabar coast, in 1511, mentions *benzin* among the more valuable items of export. In the early part of the seventeenth century there was direct commercial intercourse between England and both Siam and Sumatra. An English factory existed at Siam until 1623, and benzoin was doubtless one of the commodities exported.

The tree which produces this so-called gum does not attain to any considerable size. It is an inhabitant of the hot plains, and flourishes best in the rich, moist lands fitted for the cultivation of marsh rice.

The plants are propagated from a seed, which resembles a small, brown nut, and but little care is required except to keep the shrubs clear from weeds. Before the sixth or seventh year the gum is obtained by making incisions in the bark, when the substance exudes, and is scraped off in like manner as the opium poppy. The first juice is the purest and most fragrant, and hardens on exposure to the air, when it becomes brittle and transparent. The resin is white and transparent, and about three pounds are given by each tree. The white Benjamin is termed *cowie luban* in India, and is a superior kind. Afterwards a browner description is extracted, and finally, when the tree has become exhausted and has been cut down, an inferior kind is obtained from the scraping of the wood. The three different varieties accordingly bear relative values in commerce. The resin which exudes during the first three years is said to be fuller of white tears, and therefore of finer quality than that which issues subsequently, and it is termed by the Malays *Head benzoin*. That which flows during the next 7 or 8 years is browner in color and less valuable, and is known as *Belly benzoin*; while the third sort, obtained by splitting the tree and scraping the wood, is called *Foot*; this last is mixed much with bark and refuse. Benzoin is brought for sale to the ports of Sumatra in large cakes, called *Tampang*s, wrapped in matting. These have to be broken, and softened either by the heat of the sun or by that of boiling water, and then packed into square cases, which the resin is made to fill. A variety of the Sumatra benzoin is distinguished by the London druggists as *Penang Benjamin*, or *Storax-smelling Benjamin*. The quality is very fine, full of white tears, some of them two inches long, the intervening resin being greyish. The odor is very agreeable and perceptibly different from the Siam, or the usual Sumatra sort.

The only account of the collection of *Siam benzoin* is that given by Sir R. N. Schomburgk, for some years British Consul at Bangkok. He represents that the bark is gashed all over, and that the resin which exudes collects and hardens between it and the wood, the former of which is then stripped off. This account is confirmed by the aspect of some of the Siam benzoin of commerce, as well as by that of pieces of bark; but it is also evident that all the Siam drug is not thus obtained. Schomburgk adds that the resin is much injured and broken during its conveyance in small baskets on bullocks' backs to the navigable parts of the Lenam, whence it is brought down to Bangkok. The most esteemed sort is that which consists entirely of flattened

tears or drops, an inch or two long, of an opaque, milk-like white resin, loosely agglomerated into a mass. More frequently the mass is quite compact, consisting of a certain proportion of white tears of the size of an almond downwards, imbedded in a deep, rich, amber-brown translucent resin. Occasionally the translucent resin preponderates, and the white tears are almost wanting. In some packages the tears of white resin are very small, and the whole mass has the aspect of a reddish-brown granite. There is always a certain admixture of bits of wood, bark and other accidental impurities. The white tears, when broken, display a structure with layers of greater or less translucency. By keeping, the white, milky resin becomes brown and transparent on the surface. It is very brittle, the opaque tears showing a slightly waxy, the transparent a glassy fracture. It easily softens in the mouth, and may be kneaded into the teeth like mastic. It has a delicate balsamic, vanilla-like fragrance, but little taste. When heated, it evolves a more powerful fragrance, together with the irritating fumes of benzoic acid; its fusing point is 75° C. The presence of benzoic acid may be shown by the microscopical examination of splinters of the resin under oil of turpentine. Siam benzoin is imported in cubic blocks, which take their form from the wooden cases in which they are packed while the resin is still soft. The Sumatra kind is imported in cubic blocks, exactly like the Siam, from which it differs in its generally greyer tint. The mass, however, when the drug is of good quality, contains numerous opaque tears, set in a translucent, greyish-brown resin, mixed with bits of wood and bark. When less good, the white tears are wanting, and the proportion of impurities is greater. In odor, it is both weaker and less agreeable than the Siam drug, and generally falls short of it in purity and handsome appearance, and hence commands a much lower price.

The medicinal properties of benzoin are very slight, but it is employed for many different purposes. The Java chiefs are fond of smoking it with tobacco, and the worst kind is more esteemed by the Arabs than their own best olibanum or frankincense. In perfumery, it enters into a large number of preparations, such as fumigatory pastilles, *Poudre à la Marechale*, etc.; the alcoholic tincture, mixed with 20 parts of rose-water, forms the cosmetic virginal milk. In certain varnishes on snuff boxes and walking sticks, when heated in the hand, the agreeable odor of benzoin is emitted, and it is added to the spirituous solution of isinglass, with which court-plaster is made. The

use of benzoin for religious observances amongst nations in various stages of civilization, and the steady demand for it in all ages, declare that it is one of those commodities the taste for which is inherent in our nature, and not the result of a particular caprice with any individual people, as in the case of Malay camphor with the Chinese.—*The Chemist and Druggist*, December 15, 1875.

THE ALKALOIDS OF THE ACONITE ROOTS.

BY G. H. BECKETT AND C. R. ALDER WRIGHT.

The authors have analyzed various alkaloids and their salts prepared from aconite roots by Mr. J. B. Groves (Weymouth) in the following way: The ground roots were treated with alcohol acidulated with hydrochloric acid, and the extract thus obtained was boiled down to a small bulk; by precipitation with ammonia and agitation with ether, a mixture of bases was then obtained from this liquor.

Roots of *Aconitum ferox* (Nepaul aconite) thus treated yielded an ethereal extract from which a base crystallized by spontaneous evaporation; this base yielded salts so difficultly crystallizable, that hitherto they have been obtained only as varnishes; it has been termed by Mr. Groves "pseudaconitina," which name the authors provisionally retain, hoping hereafter to be able to elucidate its true relationship to other bodies, but abstaining from renaming it till this is done. After several purifications by crystallization from ether and alcohol, this base gave numbers agreeing best with the formula $C_{36}H_{40}NO_{11}$, the free base and the gold salt being examined; the platinum salt is somewhat readily soluble in water and alcohol, and does not crystallize readily.

By converting this substance into iodomercurate (by precipitation with mercuric iodide dissolved in potassium iodide), and regeneration by means of sulphuretted hydrogen (to remove mercury) and plumbic acetate (to eliminate iodine) in alcoholic solution, more or less change seems to be produced. One specimen prepared thus by Mr. Groves crystallized in well-defined rhombohedrons, which showed a diminished percentage of carbon as compared with the original "pseudaconitina"; the quantity of these crystals, however, was insufficient for the complete determination of the formula. Other specimens prepared in this way from "pseudaconitina" by the authors exhibited the same kind of action, the percentage of gold in the gold salt being somewhat raised, and hence apparently the molecular weight of the base being lowered;

these specimens, however, did not crystallize in the well-defined rhombohedrons exhibited by the other substance. All these specimens appeared to be eminently toxic: besides "pseudaconitia," amorphous or difficultly crystallizable alkaloids were obtained from the alcoholic extract; but as yet these have not been fully examined.

Roots of *Aconitum Napellus*, when treated in the same way, yielded a mixture of at least two alkaloids, forming readily crystallizable salts, besides other amorphous bases. Of these two bases, one partially separated as a hydrochloride at a certain stage during the working up of the ethereal solution; this hydrochloride, when purified by successive crystallizations, yielded numbers agreeing best with the formula $C_{31}H_{45}NO_{10} \cdot HCl \cdot 1\frac{1}{2}H_2O$, the formula of the free base being $C_{31}H_{45}NO_{10}$, and that of the gold salt $C_{31}H_{45}NO_{10} \cdot HCl \cdot AuCl_3$. The platinum salt of this base is also somewhat readily soluble. Although the salts (e. g., the nitrate and hydrochloride) of this base crystallize with great facility, it was not found practicable to obtain the free base in a crystalline form; from all solvents tried, it separated only as a varnish. Comparatively speaking, this base is inert; its salts do not produce the tongue-prickling characteristics of aconite roots, but have a pure bitter taste; Mr. Groves found that half grain doses taken by himself produced no noticeable effects.

The liquor from which this hydrochloride separated contained, besides a large quantity of this non-crystallizable base, a second alkaloid separating from the ethereal solution of the mixed bases by spontaneous evaporation in anhydrous crystals; after several crystallizations from ether, numbers were obtained leading to the formula $C_{33}H_{45}NO_{11}$, the air-dry hydrochloride being $C_{33}H_{45}NO_{11} \cdot HCl \cdot 3H_2O$. This substance agrees in physiological and physical characters with the "aconitia" of Duquesnel and others; Duquesnel, however, attributed to crystallized "aconitia" from *A. Napellus* the formula $C_{27}H_{40}NO_{10}$ ("Compt. rend.," lxxiii, 207), which requires very different numbers from those found by the authors; his mode of preparation, however, was somewhat different from that adopted by Mr. Groves, alcoholic tartaric acid being employed instead of alcoholic hydrochloric acid, and the extract being evaporated at a temperature not exceeding 60°. Putting the alkaloid through the mercuric iodide process seems to lower its molecular weight.

It seems highly probable, on comparing the above results with those of others who have worked on the subject, that the aconite roots con-

tain various alkaloids, or else that the alkaloid present is extremely alterable. Duquesnel has suggested that "aconitia" is probably a glucoside; this view is quite in harmony with the results obtained, different specimens being not improbably mixtures of the glucoside and the product of its deglucosation. "Pseudaconitina," when left in contact with water and emulsin, emits an unpleasant fermentative odor, and partially dissolves, the solution containing a salt giving a reddish coloration with ferric chloride, presumably an acetate; no glucose, however, could be detected in the liquid at any stage of the action.—*Journ. Chem. Soc.* [Lond.], Dec., 1875, from *Year-book of Pharmacy and Pharm. Conf. Trans.*, 1875.

REPORT ON THE DEVELOPMENT OF THE CHEMICAL ARTS DURING THE LAST TEN YEARS.*

BY DR. A. W. HOFMANN.

(Continued from p. 35.)

Tessié du Motay and Maréchal† have introduced a valuable modification into practice, as they require no steam-boiler for the manufacture of the water-gas, and thus economise fuel, whilst the wear of the simplified apparatus is considerably reduced. They heat coal with soda, hydrate of lime or of baryta in iron retorts, and thus decompose the combined water of these bases, which is then freed from carbonic acid in the ordinary manner. This procedure has been adopted by the New York Oxygen Company, who, in the manner described above, sell water-gas at the enormous price of 2 cents per cubic foot, or 1 cubic metre for 3s. 6d.‡ The mixture of lime and anthracite is heated in retorts, such as those described above under Tessié du Motay's method of preparing oxygen. The decomposition takes place at a red-heat, according to the equation— $C + CaO + 2H_2O = CaCO_3 + 2H_2$, and lasts about fifteen minutes. Thereupon hydrate of lime is reformed by passing steam over the heated mass. The carbon is not exhausted until after three weeks, and is then replaced by a fresh supply of anthracite.

That coal-gas contains large quantities (30 to 50 per cent.) of free hydrogen, and that the proportion of this ingredient rises, the higher the temperature of the retorts in preparing the gas, has long been known. Tessié du Motay and Maréchal, whilst introducing the above-described procedure, have taken advantage of this circumstance, and have passed coal-gas over lime in order to resolve it into carbon, hydrocarbons boiling at high temperatures, and large quantities of hydrogen. At the same time E. Vial§ adopted the same method, and has doubled, and even trebled, the yield of gas by "decarburation." Schinz|| doubts the industrial value of this process, on account of the outlay for fuel, and calculates that the decomposition of

* "Berichte über die Entwicklung der Chemischen Industrie Während des Letzten Jahrzehends."

† "Bull Soc Chim.," 1868, i., 334.

‡ H. Vogel, "Ber. Chem. Ges.," iii., 908.

§ Vial, "Genie Industriel," 1869. "Dingl. Pol. J.," cii., 382.

|| Schinz, "Dingl. Pol. J.," cii., 388.

water by means of coal yields a luminous gas for half the cost of coal-gas. Here, however, as we shall presently see, the depreciation of the plant has not been taken into account.

If we now inquire in what manner the hydrogen, however obtained, is rendered luminous, we find two essentially different methods. The one depends on mixing the water-gas with hydrocarbons. As early as 1834* Selligie employed, at Prais, the oils obtained by distilling the marl-shales of Autun in order to saturate the water-gas with gaseous hydrocarbons. White subsequently passed the water-gas through retorts in which rosin or coal was converted into luminous gas, and his process was carefully examined in 1851 by Frankland,† who concludes a laudatory report with certain propositions, of which the following are the most important:

1. The production of gas from given weights of common coal or of cannel is increased by 46 to 290 per cent., according to the quality of the material employed.
2. The luminous power is increased by 12 to 108 per cent., the more when coals are employed which produce gas of a highly luminous power.
3. The quality of the residual tar is lowered, a part of it being converted into gas of a strong luminous power.

It must be remarked that tar had not at that time the value which it has subsequently reached.

White's process recurs, with trifling modifications, under a variety of names.

As the "système Leprince," or "gas mixte Leprince," it was introduced into industrial concerns at Liege, adopted by the town of Maastricht, and by some departments of the Vieille Montagne at Verviers, and was critically described by Verver in 1848 in his work above quoted. Four years afterwards a similar procedure was elaborated by Baldanus and Grüne,‡ for which Schäffer and Walcker obtained a patent in Prussia. Their process consisted in passing steam through retorts in which coal-shales, turf, and other combustibles were heated to redness. It differs, therefore, from White's process herein that the production of hydrogen and its carburation are effected in the same retort. An ordinary gas retort 8½ feet in length, is said to yield, in twenty-four hours 8,000 to 9,000 cubic feet of this gas; and in Wagemann's manufactory at Benel, near Bonn, where this process has been introduced, 1 cwt. of coal-shale was consumed per 1,000 cubic feet of gas.

Essentially different is the second method of employing hydrogen for lighting, as carried out in 1846 by Gillard, at Passy, near Paris. He fixed on the burners,§ from which the water-gas issued, baskets of platinum wire, which, on the ignition of the gas, were heated to brilliant whiteness. Hence it was called platinum gas (*gaz platine*). The immobility of the light, even in a strong wind, the dispensing with lamp-glasses, which, according to Verver, absorb 22 per cent of the light, and the brilliance obtained on this principle, must be considered as advantages, although the intensity is not free from objections. Its use was not continued at Passy, but it was introduced by the celebrated firm of Christofle & Co., into their electro-plating works at Paris,|| and was employed to light the streets of Narbonne. The hourly

* Dumas, "Handbuch der Chemie," vii.

† Frankland, "Ann. Chem. Pharm.," lxxxii., 48.

‡ "Journal für Gasbeleuchtung," 1862, p. 63.

§ Report by O. Henry, "Journ. Pharmacie" [3], xvii., 105; Dingler's Journal, cxvi., 222; and the Reports of Bromeis and Ververs.

|| Wagger, "Handbuch der Technologie," 1873, ii., 371.

consumption of gas being 3.234 cubic feet (≈ 0.1 cubic metre), the light was equal to that of 5.22 normal candles, and, though the lamps at Narbonne were placed at intervals of 50 metres, Verver pronounced the lighting of the streets as perfect.

Latterly, since the preparation of hydrogen has been improved by Tessié du Moizay and Maréchal, new attempts have been made in Paris to light up large squares and streets with "platinum gas." Spectators, however, may find justification for the caricatures in the Parisian comic journals of that time, which represent the passengers in the streets, and even infants in arms, and the very dogs in the gutters, equipped with eye-shades to preserve their sight.

Technical literature has the peculiarity that it records the introduction of novelties, but leaves us in the dark concerning their practical verification. It keeps a tolerably exact register of the births of inventions, but gives a very imperfect account of their career in life and of their deaths. Thus, with a single exception, we are left in the dark as to the permanent results of lighting with hydrogen.

The experiments made with water-gas at the town Elizabeth, in New Jersey, yielded unsatisfactory results, as made known in 1865.* Great depreciation of plant, heavy working expenses, and disproportionate consumption of fuel were the causes of failure.

It was, therefore, the more desirable to ascertain in how far the process had proved successful in Europe, and, thanks to the kindness of several correspondents, we have succeeded in obtaining information. The fate of the method in Belgium appears from an extract from a letter which M. L. de Koninck, Professor of Chemistry at the University of Liege, kindly forwarded to the present writer:

The *système Leprince*, which consists in the introduction of small quantities of water into the retorts in which coal is distilled, had for a short time a certain success (*une certaine vogue*), depending mainly on numerous reclamations by which it was helped out. Its chief advantage was supposed to lie in the fact that it drove the gas out of the retort, a purpose for which an exhaustor or aspirator is now preferred. The system has never been employed for public purposes in Belgium, but merely in certain manufactories. Since the death of the inventor, which took place some years ago, it is no longer spoken of, and has been generally, if not universally, abandoned. This has been the case at Vieille-Montagne.

In a letter dated March 18, 1874, M. Landolt, Professor of Chemistry at the Polytechnic School of Aachen, confirms these statements. The use of water-gas is continued only in Cockerill's works at Seraing. At Simoni's cloth-works at Verviers, the process never advanced beyond the stage of unsatisfactory experiments, although certain technological papers have asserted to the contrary. In Maestricht, where the water-gas was used for some time for public purposes, it has, as Professor Landolt has been informed, failed to give lasting satisfaction, and has been replaced by coal gas two years ago (1872). Direct inquiries addressed to the municipal authorities have remained unanswered.

The above statement of the introduction of the Drummond light in English military establishments led to an inquiry being addressed to the Chemist to the War Department, Mr. Abel, of Woolwich, from whom the following courteous reply was received, under date April 20, 1874: "As regards your inquiry concerning

* Wagner, "Jahresberichte," 1865, 758.

the introduction of the lime-light in military premises, I have to communicate that at the period you mention, experiments were made for a short time in two of our establishments, but that the question of its formal introduction has never been seriously entertained."

The illumination of the galvano-plastic works of Christoffe with water-gas was likewise of brief duration, and the process has been long ago abandoned. We are indebted to this firm for the following communication under date April 21, 1874: "In reply to your letter of the 17th, we have to state that the use of hydrogen in our works came to an end in 1853 on account of certain difficulties (*inconvenients*) which presented themselves, and that we have no longer preserved the documents bearing upon the matter."

It only remained to ascertain the fate of the so-called platinum gas at Narbonne. To do this with certainty, there appeared no other method than to appeal to the courtesy of the municipal authorities. The Mayor of Narbonne had the kindness to comply fully with our request, and to sign the following instructive and characteristic letter, dated March 16: "The relations of Prussia and France since the war impose upon me the greatest caution as regards inquiries. As the question, however, is one of a purely scientific nature, I have handed over your letter to the Abbé Prax, chemist to the Agricultural Society of Narbonne, who has for a long time occupied himself with the subject. I have the honor to enclose a copy of the memoir which he placed in my hands."

Account of the Water-gas in Narbonne from 1855 to 1865.

"In May, 1855, I was sent to Paris by the municipality to test the water-gas of Passy. My report was dated June 8, 1855. The town adopted this method of lighting and heating, and came to an agreement with the company called the 'Narbonnaise.'"

"From 1856 the Passy system was in use in Narbonne. We modified the burners in several respects, as those of Passy were not sufficiently lasting. The high temperature of the retorts occasioned from time to time the loss of a furnace, and after many losses the system of retorts was abandoned in favor of another apparatus, the 'Cubilot' (Faye's apparatus). Towards the end of 1858 it was heated with wood charcoal, which soon gave place to coke on account of its costliness. At the same time we made important changes in the burners and platinum baskets, the latter of which were suspended instead of resting upon the former.

"The illumination with hydrogen is brilliant but sensitive (*délicat*). The lamps in the streets must be well closed, as a gust of wind distorts the ignited platinum wick. The dust introduces sand, which forms a silicide of platinum, and this metal ultimately assumes an injurious crystalline structure, and is even partially volatilized.

"In Narbonne all care was wanting towards the end of the career of the company Narbonnaise. The manager, M. Crouzet, became a wine merchant in Paris. All superintendence was withheld, and the lighting became at last intolerable. In June, 1865, therefore, coal gas was introduced. As far as heating is concerned, nothing can, in my opinion, compete with water-gas in convenience and cheapness."

PRAX, Chemist to the Agricultural Society.

Narbonne, March 15, 1874.

On the evidence of these documents, the procedures for illumination with hy-

drogen, hitherto employed, must be condemned if anything further is desired than the display of objects and transparencies for the lecture-room or the stage.

Hydrogen lighting was not represented at the Vienna Exhibition—a further indirect evidence that it had not found any wider application.

An objection, long known, depends on the high coefficient of diffusion of hydrogen, and its consequent ready escape through the pores and fine chinks of the mains, a circumstance the more dangerous, as hydrogen is not, like coal-gas, at once detected by its odor. The diffusion-coefficients of gases, according to Graham's experiments, are inversely as the square roots of their specific gravities.

But if lightness is a disadvantage for the delivery of hydrogen through pipes, we have now to consider the advantages springing from the same attribute. In November, 1782, a dream long cherished seemed on the point of fulfilment. The Brothers Etienne and Joseph Montgolfier sent up the first balloon at Avignon by means of hot air.*

With natural enthusiasm the populace of Annonay applauded them when, on June 4, they repeated the experiment of the previous year on a larger scale, and king, court and capital congratulated the inventors when they repeated it soon afterwards at Versailles. The dominion of the air seemed won for mankind, to whom space had now no limits. To day we look back upon the invention with a cooler glance, as, in spite of the lapse of ninety years, it has remained in its infancy. We are still unable to speak of aerial navigation, since the balloon, incapable of being steered, has remained the plaything of the air instead of becoming its ruler. One step, indeed, towards the desired end was taken when Charles, Professor of Physics at the Conservatoire des Arts et Métiers, at Paris, substituted hydrogen for the heated air in the balloon. On August 27, 1783, Charles, in concert with the Brothers Robert, skillful mechanics, accomplished the ascent of the first hydrogen balloon in the Champs-Élysées, his invention being known as the *Charlière* in contradistinction to the *Montgolfière*. Both systems were used for the first aerial voyage, the one in November and the other in December of the same year. Previously the balloons had been sent up empty, or only tenanted by some animal. The first aerial navigator, Pilâtre de Rozières, conceived the idea of combining both systems, which was the occasion of his death. The fire in the *Mongolfière* was communicated to the hydrogen in the *Charlière*, and on June 15, 1785, balloon and aéronaut fell shattered on the limestone rocks of the coast, near Boulogne.

The motive for this unfortunate combination was the wish to raise or lower the balloon by stirring up or extinguishing the fire—a plan which makes ballast superfluous, and which has been revived in a recent essay† by Captain Gaede (of the Military School at Hanover), and with due precautions would be doubtless practicable. Since the time of Pilâtre de Rozières 3,700 balloon ascents have been undertaken, and only sixteen fatal accidents have been heard of,‡ due chiefly to montgolfières, though the sea has been repeatedly crossed by aéronauts. Not long after the discovery of balloons they were used both for practical and for scientific purposes.

* The historical details concerning aéronautics, where no other authorities are given, are taken from the excellent summary of Louis Figuler in "*Merveilles de la Science*," ii., 426-626. See also Marion, "*Les Ballons*," Paris, 1867; and Fonvielle, "*La Science en Ballon*," Paris, 1869.

† Gaede, "*Ueber den Bau Gefesselter und Lenkbarer Luftschiffe*." Berlin: Mittler, 1873.

‡ Stephan, "*Weltpost und Luftschiffahrt*." Berlin: 1874.

•Coutelle used them for military reconnoitering, and, according to Carnot's testimony, contributed essentially to the result of the battle of Fleurus. On the other hand, Captain Gaede considers the results attained by means of balloons, especially in reconnoitering fortified places, both in earlier campaigns and in the Franco-Prussian war of 1870-71, as insignificant. Napoleon I. regarded the military efficiency of the balloons of his time not more favorably. After his return from Egypt—where the attempt to convince the natives of the superiority of Europeans by means of a balloon ascent had failed, owing to their fatalistic indolence—he closed the military-aërostatic school which had been founded at Meudon under the management of Coutelle and Conti, evidently holding its military results as unimportant.

Ballooning has been made subservient to the purposes of meteorology and physics before it was enlisted in the service of the war-spirit. Charles utilized his expedition for scientific purposes. On July 18, 1803, he was imitated by Robertson, who ascended from Hamburg to the height of 7,400 metres, and who imagined that he perceived at this altitude a decrease in the intensity not merely of terrestrial magnetism, but also of frictional electricity. These statements induced the great physicists, Biot and Gay-Lussac, to undertake two ascents the next year. They refuted the above-mentioned views of Robertson, remarked the decrease of atmospheric moisture with increasing altitude, and made numerous and valuable meteorological observations. From the greatest height which they attained, 6,500 metres, Gay-Lussac brought back a specimen of air, and found that it had the same composition as the air of lower regions—a result, at that time, of capital importance. The last-mentioned ascents were all made with hydrogen gas. As the use of gas-lighting became more and more general the greater power which the lightest of all known bodies offers was sacrificed to the convenience which coal-gas afforded. In France, Barral and Bixio made their scientific ascent, in 1850, with the aid of coal-gas. In England, Glaisher adopted the same plan in 1864, and the numerous balloon voyages which have been made for the amusement of the public, from the love of adventure or for some especial purpose, have been undertaken with the same material. With coal-gas Green traveled in sixteen hours from London to Weilburg, in Nassau, in 1836; Flammarion and Godard, in 1867, from Paris to Solingen, performing 70 German miles in twelve and a half hours. Nader, who hoped to take photographic maps whilst floating in the air, had filled his balloon, "Le Géant," with 6,000 cubic metres of coal-gas, on his somewhat dangerous journey from Paris to Hanover, October 18, 1863. More recently aéronauts have returned to the use of hydrogen. But even in those four months of the greatest siege of a metropolis of which history bears record, when Paris depended exclusively, for its intercourse with the outer world, upon carrier pigeons and balloons, which had never before been called to so important a service, even then necessity compelled the use of coal-gas, because it was procurable with the least difficulty.* 65 balloons went up from Paris between September 28 and January 22, carrying 91 passengers, 363 pigeons and 2½ million letters, and for the most part with success. Only five balloons fell into the hands of the German armies: one descended in Munich; another at Wetzlar; one disappeared entirely, perhaps in the sea; whilst the fragments of another were found, in the autumn of 1873, clinging to a tree at

* Saint-Edme, "La Science pendant le Siège de Paris," 1871, 62.

Port Natal, in South-eastern Africa. All the others descended safely beyond the radius of the besieging army in France, or upon neutral territory: one in Belgium; three in Holland; and one upon a snowfield in Norway, 60 (German) miles to the north of Christiana, and 180 from Paris, which had been traversed in fifteen hours. *

At that time, the power of steering balloons was more than ever felt to be necessary. Many of Montgolfier's contemporaries, including well-known physicists and mathematicians, such as Meusnier, Monge, Lelande, &c., had pronounced this problem to be practicable. Fruitless and partially absurd attempts at its solution were not wanting. The celebrated inventor of the injector, Henry Giffard, was not deterred from carrying out new experiments in this direction in the year 1852, and the most recent attempts are based upon his ideas and those of Meusnier. Instead of the ordinary form, Giffard gave his balloon the fish-like shape of a ship, for the convenience of steering. A steam engine, with its chimney turned downwards to obviate the risk of fire, and whose steam was simultaneously employed to maintain the draught, turned a screw sufficient to turn the balloon, but certainly too weak to overcome the strong wind which, on September 25th, drove Giffard's aerial ship before it. Public opinion then turned in favor of a project of aerial navigation opposed to all previous methods. Ponton d'Amécourt, De la Landell and Nader wished to attempt by mere mechanical force, without the aid of light gases, to navigate the air in all directions. The authority of Babinet supported this scheme, which, however, according to Helmholtz,† had no sound physical basis, and which, when carried into execution, proved a failure.

When the Paris Exhibition of 1867 drew general attention to every industrial advance, Giffard received a commission to make aeronautics available for the "million" by means of a hydrogen balloon. He constructed a balloon of 5,000 cubic metres capacity, the inflation of which, with hydrogen, generated by iron and sulphuric acid in wooden casks, cost 5,000 francs. The gas was subsequently prepared by him for a twentieth part of the cost of conducting steam over ignited charcoal, a method of which Coutelle had made use in 1794. The balloon was attached to a wire rope 300 metres in length, and was very skillfully secured. A steam engine of 50 horse power uncoiled the rope, and drew down the balloon with its passengers when the permitted height had been reached. This height was not great enough to occasion any danger from the expansion of the gas, hence Giffard was able to close the balloon with valves instead of leaving it open below. Thus, the loss of gas by diffusion did not exceed 15 cubic metres daily, and was easily replaced at intervals of three days.

The next impulse to aeronautics was given, not by festivity, but by the terrors of war and the siege of Paris. The Académie des Sciences commissioned one of its members, Dupuy de Lôme, to make experiments on steering balloons, and the government furnished the requisite means. Dupuy gave his balloon the fish shape,‡ and, in order to render its shape stable in the wind, he fitted it with an internal secondary balloon (*ballonet*), containing more or less air, and equal in bulk to one-tenth part of the main balloon. The air could be let out of this inner balloon by valves, or driven in again by means of a bellows in the car, according to a plan

* Stephan, "Weltpost und Luftschiffahrt." Berlin, 1874.

† Helmholtz, "Berl. Akad. Ber. u. Verhand. d. Ver. für Gewerbfl. in Preussen," 1873, 326.

‡ Dupuy de Lôme, "Note sur l'Aéostat." Paris: Gautier-Villars. 1872.

which Meusnier had devised as early as 1783 to supercede the use of ballast. Dupuy's balloon was further distinguished by a very firm method of suspending the car, and by the use of a varnish impermeable to gases, and made of gelatin and tannin dissolved in pyroligneous acid. The propelling screw was not turned by a steam engine, but by eight men in the car. The balloon, containing 3,450 cubic metres, was filled with hydrogen obtained from iron and sulphuric acid, and went up at Vincennes on February 1st, 1872, carrying fourteen persons. After a flight of two hours it was let down at Noyon, a distance of 106 kilometres. By means of an anemometer, Dupuy was able to determine the independent speed of the balloon at 2.82 metres per second, whilst that of the wind was 16 to 17 metres, and the course of the balloon made an angle of 12° with the direction of the wind. The problem of steering had, therefore, been solved, though only to a very slight degree—sufficient for a calm, but insufficient for overcoming even moderate winds. The speed attained was slight. Both conditions of success depend on the employment of stronger sources of mechanical power, and this, again, requires an increase of its power of ascent, *i. e.*, of its relative levity with an enlarged volume.

The calculations which Helmholtz * has lately put forward concerning the respective ratio of bulk to resistance and to speed in ships and balloons are therefore of great value. According to him the speed of Dupuy's balloon nearly attained the maximum possible for its size. In order to proceed slowly against a fresh breeze, with the sources of mechanical power at present available, the volume of the balloon must be three and a-half times larger than that of the largest ship of the line. This demands of the tissue with which the balloon is to be constructed a degree of strength scarcely possible. In fact, the expectations of the inventors did not go beyond the hope of steering the balloon when the air is tranquil. If the screws or paddle-wheels are enlarged they must also be made thicker and stronger, in order to preserve the necessary firmness. "We can only work sparingly with slowly-moving propellers of large surface, and to produce these of the requisite size without burdening the balloon too much, will constitute one of the greatest practical difficulties."

With this sentence Helmholtz concludes his memoir, and the prospects to which he points fall very far short of the enthusiastic prophecies of such as are guided by their wishes rather than by sober scientific considerations.

The problem of steering balloons turns on three conditions: the production of balloons of the lowest specific gravity; the construction of propellers, light, but capable of resistance, and of sources of power at once light and capable of performing a high duty. In how far chemistry has prepared the way towards the fulfilment of the last condition, *e. g.*, by means of aluminium, the future must decide. The first condition she has accomplished ninety years ago, by means of hydrogen, as is now fully recognized.

Upon the consideration of hydrogen and oxygen should follow an account of the industrial applications of water. These, however, are so many-sided, not to say omnipresent, that they escape our reach. The most important will be considered in especial chapters.

The elements oxygen and hydrogen form, however, as is well known, a second compound, peroxide of hydrogen, H_2O_2 , which has latterly begun to acquire a certain industrial importance.—*Chem. News*, Oct. 15–Dec. 3.

To be continued.

* Helmholtz, "Berl. Akad. Ber.," 1873, 501.

VARIETIES.

THE CONSTITUTION OF PHOSPHOROUS ACID. By A. Michaelis.—The author defends his formula for phosphorous acid, $\text{HPO}(\text{HO})_2$, and he considers that Zimmermann's trisodium phosphite contains one atom of sodium united with the phosphorus; hence its instability.

When phosphorous trichloride is dropped into boiling water, no phosphorus separates, but, if cold water is employed, a clear liquid is obtained, which soon becomes milky from separation of phosphorus. This is explained by assuming that in the case of cold water, an acid containing $\text{P}(\text{OH})_3$ is first formed, and that the bulk of this soon changes into its isomeride, phosphorous acid, $\text{HPO}(\text{HO})_2$, but at the same time a portion splits up into phosphoric acid and free phosphorus.—*Deut. Chem. Ges. Ber.*, viii, 504-506.

A NEW METAL.—M. Lecocq de Boisbaudran has announced the discovery, by means of the spectroscope, of a new chemical element, which he calls "gallium," and which he affirms to be allied to zinc. The spectroscope character of gallium is two violet lines, one corresponding to wave length 417, and the other to 404, but fainter. A commission of the French Academy has been appointed to report on the discovery. Gallium is said to be found in a special blende from Pierrefite mining works, in the Argeles Valley.—*The Amer. Gas-Light Jour.*, Jan. 3, 1876.

PRESERVATION OF FRUIT.—Fruit is kept in Russia by being packed in creosotized lime. The lime is slaked in water in which a little creosote has been dissolved, and is allowed to fall to powder. The latter is spread over the bottom of a deal box, to about one inch in thickness. A sheet of paper is laid above, and then the fruit. Over the fruit is another sheet of paper, then more lime, and so on until the box is full, when a little finely powdered charcoal is packed in the corners, and the lid tightly closed. Fruit thus enclosed will, it is said, remain good for a year.—*The Amer. Gas-Light Jour.*, Nov. 2, 1875.

CUCURBITACEOUS ANTHELMINTICS.—Some investigations have recently been made by M. Heckel into the active part of pumpkin seeds. These seeds have been much used of late for the expulsion of the tapeworm, for which purpose they were employed in the early part of the last century. The mode of their administration has hitherto been to give the bruised seeds in large quantities suspended in water, the outer envelope only having been removed. About two ounces of the seed was the ordinary dose. It is probable that so large a quantity contains much inert matter. Some recent observations apparently indicate that the active principle is contained only in the embryo. To ascertain whether this is the case was the chief object of M. Heckel's observations. He first administered, in two cases of tænia, about six ounces of the perisperm, tegumentum and testa, a purgative of castor oil having first been administered. The tapeworm was not expelled in any case. In two other cases the membrane surrounding the embryo was given—about an ounce—preceded and followed by a dose of castor oil. In each case the tapeworm was

expelled entire. Subsequent experiments yielded the same result. This membrane was then carefully examined, and found to consist of two membranes separable by maceration in water. The outer membrane contained a resin in small quantities (one in seventeen), which M. Heckel believes to be the active agent. He believes that the castor oil acts not only by its purgative effect, but by dissolving the resin and rendering it active. The second membrane contained more chlorophyll than resin. It must not be forgotten that these seeds contain a fixed oil, to which their qualities have been ascribed, and which may be obtained by cold expression from the seeds in the proportion of half an ounce to a pound. This oil has been used with success, in repeated half-ounce doses, in cases of tænia.—*Lancet*, Sept. 25, 1875, from *Mon. Abst. of Med. Science*, Nov. 1875.

PHARMACOPŒIA OF THE PHILADELPHIA HOSPITAL.—

<i>Charta Arsenicalis Composita.</i>		<i>Infusum Sennæ Compositum.</i>	
℞		℞	
Belladonnæ foliæ,	gr. xcvi	Sennæ foliæ,	℥viii
Hyoscyami foliæ,		Pulveris jalapæ,	℥iii
Stramonii foliæ,	aa gr. xlviii	Potassii bitartratis,	℥ii
Extracti opii,	gr iv	Aquæ bullientis,	Ovi
Tabaci foliæ,	gr. lxxx	Macera per horas duas, cola, et adde—	Oii
Aquæ,	Oi	Tincturæ sennæ compositæ,	
Fiat infusum, et adde—		Misce. Signa—Dose, a tablespoonful.	
Potassii nitratis,	gr clx	<i>Linimentum Chloroformi Compositum.</i>	
Potassii arsenitis,	gr. cccxx	℞	
Fiat solutio.		Chloroformi,	℥3ii
Saturate bibulous paper, and dry for use.		Tincturæ aconiti radices,	
		Aquæ ammoniæ,	aa ℥3ss
		Olei olivæ,	℥3v
		Fiat linimentum.	
<i>Glycerita Olei Ricini.</i>		<i>Linimentum Saponis Viridis.</i>	
℞		℞	
Olei cinnamomi,	gtt. xxiv	Saponis viridis,	℥i
Olei ricini,		Alcoholis, q. s. ut fiat solutio.	
Glycerinæ,	aa ℥3iv	Liquefac cum leni calore.	
Misce.		Misce et filtra.	

(To be continued.)

MINUTES OF THE COLLEGE.

PHILADELPHIA, December 27th, 1875.

A stated meeting of the Philadelphia College of Pharmacy was held this afternoon at the College Hall.

Dillwyn Parrish, President, occupied the chair, and fifteen members registered their names.

The minutes of the meeting held in September were read and approved.

The minutes of the Board of Trustees, since September, were read by Wm. C. Bakes, Secretary of the Board, and on motion adopted.

Mr. Bullock, on behalf of the Committee on the Centennial, reported progress. He and Mr. Shinn urged upon all the members the importance of assisting the Com-

mittee in their labors, as it was desirable to have the Hall put in order in time to be ready for the entertainment of such persons as may visit us in the Spring.

Prof. Remington, on behalf of the Committee on the Cabinet, reported the cases about one-half filled, with many other specimens promised.

Prof. Maisch alluded to the cases which had been prepared for the Herbarium, lately presented to the College by Daniel B. Smith, as being in readiness to receive the books of specimens; their arrangement will soon be completed.

There being no further business, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

MINUTES OF THE PHARMACEUTICAL MEETING.

The fourth regular meeting of the session was held January 18, 1876, Charles A. Heinitsh in the chair. Number in attendance, thirty. The minutes of the previous meeting were read. Dr. Pile inquired if the examination for Ammonia in Phosphoric acid, prepared by Prof. Markoe's process, was performed at the meeting. Prof. Maisch explained that it was commenced there with the understanding, if completed in time, it should be incorporated in the minutes, which were then approved.

The Registrar presented to the library, from the National College of Pharmacy, a copy of "Formulas of non-official Preparations, District of Columbia, 1875" they being the result of a joint committee of the medical society and that college.

Prof. Maisch presented, on behalf of the Executive Committee of the American Pharmaceutical Association, "Proceedings of the American Pharmaceutical Association, 1875, volume 23." This is the largest volume yet issued, containing 899 pages of interesting matter. The Professor also read a letter from Mr. Prats Grau, Barcelona, and presented from him the first part of a work, entitled "Tradato Pharmacia Operatoria," written by Dr. Fors Cornet, this second edition being edited by Mr. Grau. He also presented to the cabinet a specimen of *Grindelia squarrosa*, from Dr. J. H. Bundy, of Calusa, California, who is investigating its medical properties.

J. W. Worthington exhibited Phosphorus of very handsome appearance, made at the Rancocas works, N. J. R. V. Mattison read a paper on "Factitious Balsam Tolu," (see page 51). Storax being the adulterant, Prof. Maisch said that styracin could be readily obtained in white crystals, from its solution in hot petroleum benzin; it is slightly, but cinnamic acid freely, soluble in cold alcohol.

J. J. Brown read a paper on "the importance of Garbling Drugs," (see page 52). Prof. Maisch was glad to see the young men active in calling attention to these matters, and from personal observation, confirmed many of the statements, but said that most of these admixtures could not be regarded as adulterations, but were the result of careless handling. Dr. Pile and others had met with instances in which packages had been sent out incorrectly labeled, and while we should have charity for the wholesale dealer who had difficulty in obtaining garbled crude drugs, it was no excuse for the retailer, who aimed to purchase at low figures, and whose duty it was to examine every article. Prof. Maisch observed that the bad articles were not all found in America.

On motion, thanks were returned for the donations, and the papers read were referred to the publication committee.

A. P. Keller desired to know if the sale of alcohol on Sunday was a violation of the "Sunday Liquor Law." While difficult to answer this question legally, it is quite readily done when a desire to satisfy a clear conscience is the selling motive.

J. W. Worthington exhibited so-called Magnetic Fountain Water from Slaterville, New York. It is claimed to have the property of rendering steel magnetic. The sample present did not substantiate this.

E. M. Boring exhibited Gluten pearls containing liquids and solids, and wished to know as to how they are filled. Also, Syrupus Scillæ Compositus, in good condition, although made two years ago. (See "*Am. Jr. Ph.*," 1871, p. 101).

J. W. Worthington exhibited a dropper for counter use, invented by Chas. A. Bowman, of Nashville, Tenn. It consists of an $\frac{1}{8}$ ounce of sulphate of morphia vial, having a hole drilled in its shoulder through which a bent tube is passed; over the neck is slipped a finger cot, having its end indented, and the cavity filled with a cork.

Dr. Pile exhibited "The Pharmacopœia of the Dispensary of the University of Pennsylvania." Many of the formulas have been prescribed out of the hospital, and a desire was expressed that they be published in the Journal.

J. T. Shinn had found Basham's mixture prescribed, and there was a difference in the recipe as obtained from different sources. Twenty minims of Tincture of Chloride of Iron and one fluidounce of solution of Acetate of Ammonium are the proper proportions.

Adjourned, to meet on February 15th, 1876, at 8 o'clock P. M.

WILLIAM MCINTYRE, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

RHODE ISLAND PHARMACEUTICAL ASSOCIATION.—At the annual meeting the following officers were elected for the ensuing year: President, Albert L. Calder, of Providence; Vice-President, James H. Taylor, of Newport; Secretary, Francis J. Phillips, of Providence; Treasurer, William H. Blanding, of Providence; Standing Committee, Norman N. Mason, of Providence; Ferdinand Smith, of Providence; Charles H. Congdon, of East Greenwich.

The Treasurer, Mr. Wm. B. Blanding, presented his annual report of receipts and expenditures for the year, showing a generous balance in the treasury.

A committee was appointed, with instructions to inquire into the reported infractions of the pharmacy law, and report what action, if any, is advisable or necessary for the Association to take to secure a better enforcement of the law.

Several matters of interest to the profession were introduced and appropriately discussed by the members generally.

Mr. N. N. Mason read a very interesting extract from Tomlinson's translation of Renod's "Dispensatory of Pharmacy," published 1657, giving a quaint description of "what an apothecary should be."

Adjourned to second Monday in April.

THE NEW YORK ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY met at Plimpton Hall, January 4th.

Mr. Plummer presented a paper on "Chloro-phosphide of arsenic," and exhibited a specimen. He stated that this compound had recently appeared in this market, claiming to be prepared after the formula of Dr. Rauth, which consists in bringing phosphorus and arsenic, in a finely-divided state, together in the presence of hydrochloric acid, the operation to be conducted with great care, and the presence of iron to be avoided, the liquid to be diluted with water so that 1 fluidounce of the solution represents 1 grain of arsenic and one-sixth grain of phosphorus. The specimen presented was colorless, of a very slight phosphatic odor, and of a rather pleasant taste. He stated that he was unable to produce a like preparation by the process which, perhaps, is not correctly given, and thought that a combination of phosphorus and arsenic, in a stable and soluble form, would result in a valuable neurotic compound, citing the reports of Dr. Hammond regarding the more definite action of phosphorus when combined with metallic bases, and which has been corroborated in the experience of other prominent physicians. Arsenic is known to exhibit an action upon the human economy somewhat similar to that of phosphorus; it seems an important subject for the attention of chemists.

Mr. Wellcome read a paper on "*Eriodaction Californicum*," a drug which has long been in use by the Spaniards and Indians of Mexico and California as a specific for chronic lung diseases, and as a certain cure for consumption. He exhibited some very handsome specimens of the plant. Prof. Maisch had received a specimen, which he presented at the College meeting last May.*

Other matters of minor interest were discussed. Next meeting will be held Tuesday evening, February 1st.

CINCINNATI COLLEGE OF PHARMACY.—At the regular meeting, held January 12th, the following officers were elected to serve for the ensuing year: President, F. L. Eaton; Recording Secretary, A. W. Bain; Corresponding Secretary, Louis Schwab; Treasurer, W. H. Negley; Board of Trustees—Chas. Faust, H. H. Koehnken, John Weyer, Chas. Schmidt.

The reports of the retiring officers gratifyingly indicated the progressive condition of the College.

The retiring President, Prof. E. S. Wayne, in a neat and appropriate speech, thanked the members for their attention and the kind assistance they had tendered him in the conduct of the duties that he had attempted judiciously to discharge in the past year, and earnestly hoped a continuance of the same for his successor.

The newly elected President, Mr. Eaton, on being conducted to the chair by Messrs. Negley and Schmidt, spoke feelingly of the honor thus suddenly conferred upon him; promising, to the best of his ability, to serve his term in such a manner that no regret on the part of the members should ever be suffered for having elected him.

LOUIS SGHWAB, Cor. Sec.

* The statement on page 279, "Amer. Jour. Pharm.," 1875, that the leaves of *Eriodaction glutinosum*, Benth., have an intensely bitter taste, is an error, which we omitted to correct before.—EDITOR.

THE BRITISH PHARMACEUTICAL SOCIETY held a pharmaceutical meeting Dec. 1st, the President, Mr. T. H. Hills, in the chair. Mr. Louis Siebold read a paper on "The Preparation of Pure Chemicals," in which the author treated on the difficulty of obtaining absolutely pure chemicals, such as might be supposed were intended by the "British Pharmacopœia" by the tests given in certain cases. In others, the "Pharmacopœia" allowed some impurities, without giving their quantity or the limits of the reactions indicating the impurities. The paper treated of oxalic acid, sodium and potassium carbonates and nitrates, potassium permanganate, sodium chloride and the subnitrate, subcarbonate and oxide of bismuth.

In the discussion following, it was stated that the "Pharmacopœia" rarely contemplated the absolute purity of the chemicals, which was really unnecessary; that different impurities often depended upon the kinds of vessels or the water used in manufacturing, and that manufacturers were often greatly obliged for having the nature of impurities in chemicals pointed out to them; the fact was dwelt upon that the quality of many commercial chemicals was now much better than formerly.

Mr. Ince read a paper written by the late Daniel Hanbury, on "The Spices, Groceries and Wax of a Mediæval Household, A. D. 1303-10." The paper relates to a portion of the accounts of the executors of Bishops Richard, of London (1303), and Thomas, of Exeter (1310). The articles enumerated in the paper, together with their price, are: *Cere*, wax; *ammigdale*, almonds; *ris*, rice; *zinsiber*, ginger; *sucare*, sugar; *canele*, cinnamon cassia; *galonge*, galangal; *nigrum piper*, black pepper; *granum paradisi*, grains of paradise; *crocus*, saffron, or, as Mr. E. M. Holmes thought, probably safflower, the price being £5 9s. 9d. for 38½ lbs.; *gariofoli*, cloves; *quibibus*, cubebs; *macis*, mace; *feniculum*, fennel; *anisum*, anise; *liquiricia*, liquorice; *cyminum*, cumin; *pyon*, the kernels of *Pinus pinea*; *pyonad*, a confection of the kernels with white of egg and sugar; *gyngibrad*, *gingibretum* or *zinzibratum*, preserved or candied ginger; *nux muscata*, nutmegs; *zedewand*, zedoary and others.

Mr. Louis Siebold read a paper on "Senna Extracted with Alcohol," a preparation which is extensively used on the continent of Europe. The author draws from his experiments the following conclusions:

1. Strong spirit does not remove any of the active principle (cathartic acid) from senna leaves.
2. The therapeutic action of cathartic acid is assisted by one or more of the constituents yielded by senna to strong spirit, though the latter produce no purgative effect when taken alone.
3. Senna exhausted by alcohol is a reliable and pleasant purgative, but somewhat weaker in its action than the unexhausted leaves.

Mr. Groves said that he had prepared pure cathartate of calcium, and found it to be of a very griping character. The mixed cathartates may be obtained by digesting senna leaves in diluted alcohol, and precipitating them by strong alcohol. Senna leaves exhausted by alcohol are devoid of the essential oil, and have, therefore, less taste.

Adjourned to February 2d.

PHARMACEUTICAL SOCIETY OF PARIS.—The pharmaceutical meeting, held November 3, was mainly occupied by the report by M. Ferd. Vigier on the theses presented in competition for the prize, which was awarded to M Giraud for his "Comparative studies on the gums and mucilages," the "Researches and extraction of the alkaloids, and Discovery of pterocarpina," of Mr. Cazeneuve, being honorably mentioned.

At the session held December 1st, a letter by M. George was read, asking, in the name of the pharmacists of Airne, to have the composition of certain preparations determined, which have been introduced into medical use since the publication of the Codex. The subject was referred to a committee of six.

A paper by Messrs. Bretet and Cornillon on "The action of alkalies upon the formation of urinary sugar" was read. The authors are led to the following conclusions :

1. Alkaline medicines act upon the production of glucose in urine, by diminishing the saccharifying power of the diastatic liquids, and consequently by preventing the introduction of an excess of sugar into the blood.

2. Bicarbonate of sodium acts not only upon the salivary diastase, but also upon the pancreatic liquor.

3. Its action is much more observable upon the pancreas of the omnivora than upon that of herbivorous animals.

Mr. Magnes-Lahens read an essay on "Tar," in which he stated that water would take up a larger amount of soluble matter from tar, which had been rendered pulverulent by mixing it intimately with twice its weight of saw-dust. From 9 grams of such pulverulent tar (equal to 3 grams of tar) 1 litre of water takes up, at the ordinary temperature, 1 gram of extract in four hours ; at 60° C. (140 F), 2 grams will be taken up in five minutes, and from 27 grams of pulverulent tar it will retain 6 grams of extract, which is a saturated solution. He also exhibited a new inhaler, constructed by himself.

M. Guichard spoke of pharmaceutical labels, and exhibited an apparatus for printing them.

After hearing reports on the transactions of the Academy of Sciences, the Society adjourned.

EDITORIAL DEPARTMENT.

MEDICAL STATISTICS OF PRUSSIA.—A very interesting report on this subject is before us, and we propose to give in the following a very brief resumé of the same :

At the close of 1873, there were in the kingdom of Prussia 7,923 licensed physicians, 319 surgeons, 245 dental surgeons, 2,344 apothecaries (proprietors), and 16,673 midwives. Calculated for the entire population, there was one physician for every 3,105 inhabitants, one surgeon or dentist for 43,623, one apothecary for 10,496 inhabitants, and one midwife for 373 females born between the years 1857 and 1824. However, neither these figures, nor the figures indicating the number of each class of persons residing in each province give a correct idea of their distribution. This may be arrived at by ascertaining the geometrical mean, which is obtained by

dividing them, in each province, first to the geographical square mile and likewise to each 1,000 of inhabitants, and then calculating the square root from the product thus ascertained, when the following figures will be obtained :

PROVINCE.	APOTHECARIES.			PHYSICIANS.		
	Upon 1 geog. square mile.	For 1,000 inhabitants.	Geometrical mean.	Upon 1 geog. square mile.	For 1,000 inhabitants.	Geometrical mean.
Prussia,	'19	'07	'115	'49	'18	'297
Brandenburg,	'32	'08	'160	1'70	'43	'855
Pomerania,	'19	'07	'115	'69	'24	'407
Posen,	'21	'07	'121	'48	'16	'277
Silesia,	'32	'06	'139	1'22	'25	'552
Saxonia,	'44	'10	'210	1'56	'34	'708
Schleswig-Holstein,	'20	'10	'170	1'25	'40	'707
Hanover,	'42	'15	'251	1'13	'40	'672
Westphalia,	'61	'13	'282	1'59	'33	'724
Hesse-Nassau,	'70	'14	'313	2'17	'44	'977
Rhenish Province,	'74	'10	'272	2'43	'33	'896
Hohenzollern,	'47	'15	'269	1'37	'44	'776
For the State,	'36	'09	'180	1'22	'31	'615

It will be seen that the supply of pharmaceutical and medical aid varies very considerably in the different provinces. The discrepancies are still greater if the smaller districts are compared with each other. Looking only at the extreme figures, we find that the geometrical mean of apothecaries in Berlin is 1'692, in Dusseldorf '503, but in Gumbinnen only '098, which figure is still lower in Coeslin, being '088. The difference in the number of physicians is still greater, the figures being for Berlin 25'311, Cologne 1'373, Dusseldorf 1'203, but only '118 for Königsberg, '161 for Gumbinnen and '208 for Coeslin.

CHANGES IN PHARMACEUTICAL JOURNALS.—Mr. A. E. Ebert has retired from the editorial chair of the "Pharmacist," his business connections requiring his whole attention. The "Pharmacist" will, as heretofore, be published by authority of the Chicago College of Pharmacy, the editorial labors having been entrusted to a committee appointed by the College.

The "Deutsch-Amerikanische Pharmaceutische Zeitung" has been discontinued, but its publication will be resumed if a sufficient number of subscriptions should be obtained.

The Tennessee "Pharmacal Gazette" published its last number in November, 1875.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Year-Book of Pharmacy, comprising Abstracts of Papers relating to Pharmacy, Materia Medica and Chemistry contributed to British and Foreign Journals from July 1, 1874, to June 30, 1875; with the Transactions of the British Pharmaceutical Conference at the Twelfth Annual Meeting, held in Bristol, August, 1875. London: J. & A. Churchill, 1875. 8vo, pp. 652.

This annual publication contains in its first part abstracts of papers of interest to pharmacists which have appeared during the preceding year, and are grouped under the three headings mentioned in the title, a fourth part, Notes and Formulæ, being added, but no systematic arrangement being followed, which, however, is in a measure compensated for by the copious index. The "Year-Book" embraces the first 404 pages. The remainder of the volume is occupied by the usual lists of members, associations, the programme for the meeting, the minutes, papers, &c. Of the meeting we have given an account in our last volume, published abstracts of several of the interesting papers read, and expect to bring the others to the notice of our readers in a similar manner.

The volume is creditable to the Association from which it emanates, and which, though little more than half the age of the American Pharmaceutical Association, has upon its roll a much larger number of members, a circumstance which speaks well for the pharmacists of Great Britain. Will American pharmacists profit by this good example, and unite themselves with the National Association at its twenty-fourth annual meeting in September next?

The Identification and Microscopical Examination of Crude Drugs and other Vegetable Products. By Mark W. Harrington, M. A., Assistant Professor in charge of Botany in the University of Michigan. Ann Arbor: John Moore, 1876. Pp. 34.

We have been much pleased with the examination of this pamphlet. There has, as yet, been proposed no systematic course for the study of Materia Medica against which weighty objections might not be raised; but a system based upon the organo-logical, physical and structural qualities of the drugs appears to us much more rational than their arrangement according to botanical origin, although the latter has some advantages which the former can never attain. After the labors of Schleiden, Berg, Flückiger ("Pharmakognosie," 1867), and others, the ground has been well broken, and, as a contribution in the same direction, we welcome the pamphlet before us and regret only that it is so very brief, a mere skeleton only, which, however, is the precursor of a more extended work by the same author.

Hermaphroditism, from a Medico-Legal Point of View. By Basile Poppesco. Chicago: W. B. Keen, Cooke & Co., 1875. 8vo, pp. 45. Price, 50 cents.

A translation, by Dr. E. W. Sawyer, Lecturer on Obstetrics in the Rush Medical College, Chicago, of the author's interesting thesis, presented to the Faculty of Medicine, Paris.

OBITUARIES.

PROFESSOR DR. JOAQUIN DONDÉ IBARRA died of consumption, in the city of Mérida, Yucatan, November 1, 1875. The deceased was born in Campeche, July 6, 1827, where he received his education, until he removed to Puebla in 1844, where he studied pharmacy under Prof. Mariano Cal, and graduated with honors in 1846.

In 1847 he went to the capital of the republic to place himself under the instruction of Dr. Jose M. Vargas, and passed another examination in 1849, and subsequently at the university, which conferred upon him the title of Associate.

In 1850 he opened a School of Pharmacy in Campeche, and in 1853 one in Mérida, laboring in the latter until a few months before his demise. During this time he lectured, for a number of years, on botany in the Catholic Institute, and since 1870 acted as Director of the class in Industrial Chemistry, founded by the Society "Jesus Maria." In the same year the State School of Medicine and Pharmacy was established, he being one of the founders, and elected honorary professor in 1875. He was likewise active in founding, in 1871, the only Medical Society in the State, and contributed much towards its usefulness. The Academy recognized his sterling qualities by making him an honorary member.

At the exposition held in Yucatan, in 1871, he exhibited chemical products and was awarded a first-class medal, and received another award for his red phosphorus. In the manufacture of ordinary soap he introduced various improvements, and worked out new processes for the tanning of hides, in which he instructed many artisans, having the public good constantly in view rather than his private interests. The manufacture of the safety phosphorus matches, in Yucatan, was introduced by him in 1869.

For many years he was associated, in the pharmaceutical business, with Mr. Font, laboring principally in the laboratory.

His literary labors comprise a number of articles originally published in the "*American Journal of Pharmacy*, 1871—73," in "*L'Union Pharmaceutique*," of Paris, "*La Emulacion*" and "*La Revista de Mérida*."

Dr. Dondé was a man of sterling qualities, earnest in his labors, but modest and genial as a companion; his loss was deeply felt by the community in which he labored for so many years as a teacher, pharmacist and public benefactor.

EDWARD H. ANDREW died in New York, January 5th, in his 45th year, of rheumatism of the heart. He was the son of Rev. Sam. R. Andrew, and was born in Woodbury, Conn., October 14, 1831. He began his apprenticeship with C. B. Whittlesey, New Haven, in 1847. But his health failing in 1852, he traveled for two years, and was then engaged with G. W. De la Vergne, New York, until the war, when he joined the 9th New York regiment. Subsequently, he engaged with Caswell, Hazard & Co., and occupied, for thirteen years, an important position, in which he secured the friendship and confidence not only of his employers, but of the medical profession and the public, and enjoyed the reputation of being a most correct and reliable dispenser.

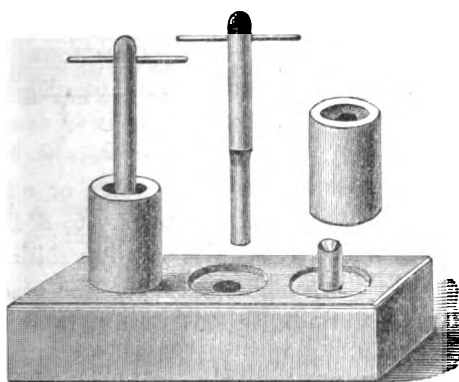
THE AMERICAN JOURNAL OF PHARMACY.

MARCH, 1876.

ON AN IMPROVED PILL PRESS.

BY JOSEPH P. REMINGTON.

Since the publication of the paper, by the writer, on the "Ready-made Pills of our day," in the Proceedings of the American Pharmaceutical Association for 1875, in which a pill press is described and figured, various improvements have been suggested, and have been introduced, which materially assist in facilitating the operation of compression. The accompanying sketch will illustrate :



The cut represents a double machine, and with it two or more sizes may be made, two and three grain pills on one, and four and five grain pills on the other, one base of cast steel answering for both.

By turning a conical depression in the top of the cylinder, a sort of funnel is made, which is a convenience

in introducing the powder.

The countersunk depressions in the base, which take the cylinders, prevent them from slipping away in case a side blow is struck. Some of the machines have been made with the lower mould stationary, and no depressions for the cylinders to fit into ; this form has some advantages, but is not believed to be as useful as that described above, for an unlucky side blow may break off the stationary lower mould, as it is made of hard steel, and this, of course, would be a fatal accident.

The middle depression in the base has an aperture which pierces it all the way through, and, after the blow is struck and the pill still

remains in the cylinder, the whole is transferred to this middle depression, when one blow drives the pill through.

In making a quantity of the pills, the base might rest on two upright posts, three or four inches high, and a box might be placed between the posts to receive the pills as they are finished.

The writer still adheres to the opinion expressed in the former paper alluded to, that compression should not be resorted to as a mode of making pills, when the powder used is *not readily soluble in the digestive fluids*, and hence the machine has but a limited use.

For acid or bisulphate of quinia pills, the machine answers very well, and as many as two hundred may be made in one hour, by having one operative to weigh the powder, and another to fill into the cylinder and strike the blow.

Like everything else of this kind, a little practice is necessary before success is assured in every instance ; some difficulty is experienced in compressing the pills if the powder used be very dry, as in the case of effloresced sulphate of quinia, subnitrate of bismuth, &c., &c.

The effect of using a powder too dry is to cause the pill to split transversely, a minute quantity is apt to be blown out of the top of the cylinder when the blow is struck, and it is almost sure to clog the piston and render it necessary to clean it frequently, which is an annoyance, to say the least.

If the precaution is taken to slightly moisten, with water or other suitable liquid, such a powder (and the amount necessary to add to accomplish the result is soon learned), the difficulties usually vanish.

The pills may be set aside to dry by spontaneous evaporation of the moisture, or they can be dried artificially, by heated air, in much less time.

When the piston does adhere, from becoming clogged as above mentioned, it may be readily released by pouring a few drops of water into the aperture on to it, which will soften or dissolve the powder.

The machine may then be washed, and the cylinder dried quickly by passing through it a thick, soft piece of twine.

In conclusion, the writer takes this opportunity to state, in answer to correspondence and inquiries in relation to this contrivance, that no patent has been procured for it, no one has the exclusive right to manufacture, and any who care to, are at liberty to use it, have one made by their own mechanic, or buy of either of the makers in this city.

Philadelphia, Second mo. 8th, 1876.

GLYCERIN DROPPER.

BY C. A. BOWMAN.



The arrangement for this purpose, noticed on page 89 of the February number of the "American Journal of Pharmacy" as an invention of my own, is only claimed as a slight improvement on the original idea of C. W. Wharton, of Nashville, Tennessee, a member of the firm of Wharton & Co., of that place.

The little apparatus consists of a small morphia or other wide-mouth bottle, having an aperture bored through the curved portion of the neck, at an acute angle with the outside edge, by means of a small, rat-tail file, after a notch has been made in the shoulder, by means of a sharp-edged file, sufficiently large for the round file to take hold, the operation being facilitated by the use of turpentine from time to time. Care should be taken to have the bent glass tube extend into the bottle, as shown in the figure, and fit tightly, as otherwise the contrivance will work imperfectly on account of escape of air from the bottle. This precaution taken, the bottle is filled with the fluid excipient, and a small finger stall drawn tightly over the mouth, which completes this simple but useful arrangement, making a convenient and proper medium for the adjustment of liquid excipients in making pill masses, and where it is necessary to get them of a proper consistency in order to turn out a good lot of pills. It is free from the inconvenience of the old mode of adjustment, and has besides the advantage of neatness, its size making it little in the way on the prescription counter. By very light pressure on the top of the rubber shield, the liquid is forced out through the glass tube in single drops, as shown in the figure, and a continuous stream can be obtained by continued and harder pressure. The flow ceases instantly on removing the finger, and air enters through the tube equal to the bulk of liquid removed.

CACHETS DE PAIN.

BY HARRY P. LECHLER, PH. G.

For some time past, the attention of physicians and pharmacists has been directed to the wafer discs found in the market under the name of "Cachets de Pain," as a method by which the most nauseous medicines may be administered in a pleasant form. Quinia, aloes, bromide of potassium and many other remedies are often very objectionable to the patient, on account of the disagreeable taste they possess, and to cover this without impairing their therapeutical value has long been a source of trouble and anxiety to the physician. This, the inventor of "Cachets de Pain" claims to have accomplished. By his theory, the patient has neither taste nor smell of any medicine prescribed, whether unpleasant to the palate or injurious to the teeth, and the medicinal properties of the compound are not in the least impaired by the enclosure.

To prepare the "Cachet" for administration, the compound prescribed is first placed in one of the concave discs, the internal surface of the rim is then moistened with water, another wafer disc is moistened in a similar manner and placed carefully over the first, the margins are then made to adhere by means of a small lever press. The medicated "Cachet" is now ready for the patient, who, by first dipping in cold water, placing upon the tongue, and with a draught of water, is enabled to swallow with ease. Thus, in theory, the "Cachets de Pain" are all that could be desired, but the question arises, How will this theory hold in practice?

In the first place, the time required to prepare twelve "Cachets" is, at the least calculation, five times longer than that required to dispense an equal number of pills or powders, and often, when the discs are moistened and pressed, we find them adhering to the press; this may be the result of an excess of moisture, or of more pressure than is actually required; but they are then to be removed with care, otherwise they will break where the line of moisture extends, thus entailing the necessity of preparing another; and after removing from the press the "Cachets" require careful drying, otherwise when placed in a box they will adhere to each other. You make answer, They were not properly prepared. Manipulate with all the skill at your command, you will often have an excess of moisture; and this, combined with the pressure exerted upon the thin coating, has a tendency to cause a rupture.

Then, in the administration of medicines in this form, we are met with a very serious objection. When the physician, not being aware that it is necessary (according to the theory) to dip the "Cachet" in cold water before placing upon the tongue, fails to convey this fact to the patient, and often, by want of thought, when in possession of this fact, does not give directions how to administer, or, of proper management on the part of the patient, it is found that, instead of disguising the compound within, the "Cachet" materially assists in the development of the unpleasantness the physician endeavors to conceal; for, when administered, the patient discovers that in place of descending the œsophagus, as expected, it has adhered to the roof of the mouth, and in his efforts to detach it therefrom, invariably succeeds in breaking the thin coating, and then enjoys the felicity of that delectable experience he would avoid. This is not only my personal experience, but that of several physicians of this city, who, having submitted this method to a fair trial, have arrived at the conclusion that "Cachets de Pain" are a failure.

Then, again, is it reasonable to suppose for an instant that two soluble salts would retain their separate and distinct characteristics when in contact with waters?

And yet the inventor of "Cachets de Pain" states that they allow the presentation of two separate and distinct salts in one envelope, which, when dissolved in the stomach, will unite and form a salt in the nascent state. For the benefit of those who favor this theory, I state the result of two experiments.

The first "Cachet" was prepared with carbonate of potassium and powdered citric acid, in a perfectly dry state; upon dipping for an instant in water, an effervescence ensued. The other was prepared in precisely the same manner, with tartaric acid and bicarbonate of sodium. The result of this experiment was a violent elimination of carbonic acid, with force sufficient to rupture the coating. If this be the result of simply dipping in water for an instant, how can the salts unite to form one in the nascent state in the stomach? It is impossible, simply because they have united before entering the stomach.

With the jujube paste capsules of M. Planten, this can be accomplished, for the reason that they require some time to dissolve before the liquid comes in contact with the contents.

These capsules are recommended by physicians for the administra-

tion of concentrated or nauseous medicinal substances, as being far superior to any method ever invented.

It is to be hoped the day is not far distant when "*Cachets de Pain*" will be referred to only as a thing of the past, which, through want of merit and practicability, fell into disuse.

NOTE BY THE EDITOR.—We can scarcely regard excessive moistening of the rim of the discs, or the omission of moistening the wafer capsules before swallowing, as sufficient arguments against the use of the *cachets de pain*; just as little as the excessive addition of an excipient or the mastication of pills by some patients can be advanced as arguments against the administration of medicines in the form of general pills. Regarding the premature effervescence which is apt to take place, if a mixture of an acid and a carbonate is enclosed in the same wafer capsule, this may be obviated by keeping the two articles separate in two distinct cells, by inserting between them a flat wafer disc, which will prevent their coming in contact until the wafer has been completely disintegrated in the stomach.

TINCTURA CAPSICI.

BY GEORGE W. KENNEDY, PH. G.

Within the last few years many changes have been recommended in the manufacture of the various pharmaceutical preparations of the pharmacopœia, some writers recommending a change in the menstruum, others a change in the quantity of solid material to be used, while others advocate a more expeditious mode of preparation. Of the first I might allude to the Tincture of Rhubarb, for which glycerin has been highly commended as an excellent solvent, and it seems to me that it would make a very desirable addition, as a more permanent preparation can be obtained,—the glycerin preventing to a great extent the precipitation of the chrysophanic acid, the cathartic principle of the drug. On the second point, as to the quantity of solid material to be used, much has been written in favor of making each pint of fluid extract represent eight troy ounces of the drugs instead of sixteen, as at present directed. On the third point, recommending a quicker method of making certain preparations, I simply desire to mention a few without discussing the advantages or disadvantages, which is not my object at this time. In the preparation of tinct. opii camph. it has

been recommended to use spiritus camphoræ and tinct. opii in such quantities as to equal the powdered opium and camphor, as directed by the pharmacopœia; and it has also been proposed to make some tinctures, syrups and infusions from fluid extracts. Some of the changes recommended are good, and it might be well for the various committees on the preliminary revision of the pharmacopœia to pay attention to this matter and experiment with the new formulas recommended, and, if they prove better than those now in use, to advise a change, otherwise let them pass by.

Up to the present time, the writer has not noticed in any of the pharmaceutical journals a recommendation to change the menstruum used in the making of tincture of capsicum. The present menstruum is not only pharmaceutically objectionable, but is more especially so in a medicinal point of view. The object that every pharmacist has, or should have, in view, is to put forth preparations that fully represent the active constituents of the drug. To arrive at a definite conclusion as to what should be the best menstruum and best process of preparation, requires a large amount of labor and experimenting, and involves also a loss pecuniarily.

My object here is to advise a change in the menstruum, used in making tincture of capsicum, from diluted alcohol to alcohol. I have two reasons for doing so: 1st, that diluted alcohol does not thoroughly exhaust the drug,—the authenticity of which can be proven by treating the dregs left after making the tincture, as now prescribed by the pharmacopœia, with alcohol, which will dissolve the hot and stimulating principle of the drug quite perceptibly; 2d, that the preparation, when made of diluted alcohol, as now directed, is rather unsightly, and does not present that elegant appearance as when made with alcohol; and in these days of pharmaceutical elegance, it is requisite to make handsome pharmaceutical preparations, so long as it can be done without sacrificing the medicinal qualities of the drug. It is just as necessary to make tincture of capsicum with alcohol as tincture of ginger. I doubt whether there is a pharmacist to be found that would think of using diluted alcohol for the latter; and since the active constituents of both ginger and capsicum are oleo-resins, and, as they are insoluble in water, we should object to the menstruum of the pharmacopœia for tincture of capsicum, and should use only alcohol, which dissolves the oleo-resin quite freely. I would therefore submit the

following for obtaining a more permanent tincture, and one which fully represents the active constituents of the drug :

Take of capsicum, in fine powder, one troy ounce ; alcohol a sufficient quantity, moisten the powder with alcohol, pack firmly in a cylindrical percolator, and gradually pour alcohol upon it until 2 pints of tincture are obtained.

Pottsville, Pa., January 20, 1876.

NOTE BY THE EDITOR.—The German Pharmacopœia directs to prepare *tinctura capsici* by macerating for eight days one part of finely cut capsicum with ten parts of alcohol spec. grav. 0·830 to 0·834.

BISMUTH AND IRON.

BY R. ROTHER.

The normal bismuthous salts are very definite chemicals, and most of them can be quite easily prepared. There are, though, a number of bismuthous oxysalts, which in general present great difficulty of preparation, owing to the variable nature of their composition. As several of these basic compounds are used in medicine, a certain regularity is aimed at in their constitution. But none of the various methods in use always yield exactly the same product by the same course of procedure.

Of the normal salts, the citrate has been the most troublesome to produce in a desirable shape and of constant composition. The writer believes to have made the first advance towards a satisfactory method of preparing it. The process was published in the *Pharmacist* for September, 1872, and consisted in crystallizing the citrate from a moderately dilute and not too strongly acidulated solution of the ammonio-citrate. Since then, the writer has adopted an entirely new method, which, for simplicity, rapidity and precision, ranks the process as absolutely perfect. The astonishing simplicity is so remarkable that one is surprised the process was not discovered long before this, since it is nature almost directly synthetic.

If the ordinary bismuthous oxynitrate is heated for a few moments with a concentrated solution of an equivalent of citric acid, the normal citrate is generated as a heavy crystalline powder, and the nitric acid entirely freed and easily washed away by decantation. 10 parts of bismuthous oxynitrate, 7 parts of crystallized citric acid, and 30 to 40 parts of water are heated together for a few minutes, until a drop of

the mixture forms a clear solution with ammonia water, the crystalline mass is then diluted with 8 to 10 times its volume of water, set away for a short time to let the citrate subside, and the clear liquid then decanted. The crystalline sediment is now washed 3 or 4 times in a similar manner, drained from superfluous water, and either dried on a water-bath or by exposure in the open air. The yield is about 13 2-3 parts, showing that the salt is anhydrous, and therefore its formula is $\text{Bi}''' \text{C}_6\text{H}_5\text{O}_7$.

The bismuthous citrate, as such, is not much prescribed, but it is undoubtedly superior to either the oxynitrate or oxycarbonate, both of which are medicinally much employed. The ammonio-citrate is considerably used, and as no method thus far proposed for this salt has been particularly applicable, the writer's new process for preparing the citrate in a perfectly pure and definite state will make it possible of producing an ammonio-citrate with great ease and dispatch, and also of perfect purity.

Dry bismuthous citrate, treated with the ordinary ammonia water, dissolves to a syrupy liquid, but a part agglutinates to a hard white mass, unaffected by excess of ammonia; if gentle heat is applied this dissolves, and on cooling, the whole forms a crystalline mass, soluble in water. These crystals, dried over a water-bath, are again soluble in water. The yield from 8 parts of the citrate is nearly 10 parts. This product shows that there are several modifications of the ammonio-citrate, which may differ in chemical constitution as well as in physical properties.

The chemical composition of the ammonio-citrate has not been correctly given. The writer found that the same quantity of ammonia was required to form a neutral ammonio-citrate, as was separately required to form normal triammonium citrate, with the equivalent of citric acid in combination as bismuth salt, and the decomposition may be written thus: $\text{BiC}_6\text{H}_5\text{O}_7 + 3(\text{NH}_4\text{OH}) = (\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7\text{Bi}(\text{OH})_3$. The compound represented by the second number is assumed to be a combination of normal triammonium citrate with normal bismuthous hydrate, and this compound must therefore be looked upon as the true ammonio-bismuthous citrate, as all other formulæ are based upon an analysis of the scaled salt, which must of necessity be an indefinite substance.

The writer has also found that normal ferric citrate when treated with ammonia, absorbs an amount corresponding as normal triammo-

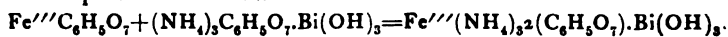
mium citrate, with the equivalent of citric acid contained in the iron citrate, and hence the true or normal ammonio-feroxycitrate is also produced as follows :

$\text{Fe}''' \text{C}_6\text{H}_5\text{O}_7 + 3(\text{NH}_4\text{OH}) = (\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7 \cdot \text{Fe}(\text{OH})_3$, that is triammonium citrate combined with normal ferric hydrate. It is, therefore, the iron analogue of ammonio-bismuthous citrate.

The writer has also ascertained that besides the normal green ammonio-ferric citrate, two other ammonio-ferric citrates exist, corresponding to the di and mon-ammonium citrates. The formulæ for the 3 green double salts are, for triammonio-ferric citrate $\text{Fe}'''(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7$, for diammonio-ferric citrate $\text{Fe}'''(\text{NH}_4)_2\text{C}_6\text{H}_5\text{O}_7 \cdot \text{C}_6\text{H}_5\text{O}_7$ or $\text{Fe}'''(\text{NH}_4)_2\text{H}_2(\text{C}_6\text{H}_5\text{O}_7)$, and for monammonio-ferric citrate $\text{Fe}'''(\text{NH}_4)\text{H}_2(\text{C}_6\text{H}_5\text{O}_7)$ or $\text{Fe}'''(\text{NH}_4)\text{H}_2(\text{C}_6\text{H}_5\text{O}_7)$. The first one only is neutral, the other two are acid salts. If either of these salts is treated with ammonia in excess, the solution becomes brown, and in some cases, as for instance with the potassium double citrates, which do not hold the iron as firmly as the corresponding ammonium salts, ferric hydrate is precipitated. The reaction, therefore, indicates that a monado-fer-oxycitrate was produced. It is, however, remarkable that the addition of citric acid or an acid monad citrate does not immediately restore the green color, but in some instances proceeds very slowly, the transition from brown to green is not simultaneous throughout the solution, but progresses from the bottom upwards, even if the solution is occasionally shaken, it resumes this order of progressive action.

The most surprising relationship, is however, evinced when ammonio-bismuthous citrate and triammonio-ferric citrate are brought together, and the change of color is the same as when triammonium citrate is added to the iron salt. The light green solution is further remarkable for the very important fact that moderate or strong acidulation with citric or nitric acid fails to separate the bismuthous citrate. This property, therefore, renders it possible of holding bismuthous citrate in acidulated solution, providing ammonio-ferric citrate is also present.

The same amount of citric acid in combination as ammonio-bismuthous citrate, is required to change an equal equivalent of the acid combined as ferric citrate into the green ammonio-ferric citrate, as would be required in the condition of triammonium citrate. Therefore the result is expressed as follows :



That is, one equivalent of triammonio-ferric citrate combined

with one equivalent of normal bismuthous hydrate. This is a most peculiar compound, and possibly indicates that the normal bismuthous hydrate ($\text{Bi}(\text{OH})_3$) differs in its affinities from the basic or oxyhydrate ($\text{Bi}(\text{OH})\text{O}$) as the normal salts differ from the oxysalts. The compound treated with ammonia in excess becomes brown, but addition of citric acid again restores the green color, however, similar as in case of the ammonio-ferric citrate alone, but slowly.

The new compound will doubtless become of pharmacal value, since the property of retaining the bismuth in an acidulated solution must strongly recommend it.

NOTE ON CITRATE OF IRON AND QUINIA.

BY J. U. LLOYD.

“Triturate the sulphate of quinia with six fluidounces of distilled water, and, having added sufficient diluted sulphuric acid to dissolve it, cautiously pour into the solution water of ammonia, with constant stirring, until in slight excess. Wash the precipitated quinia on a filter, and, having added it to the solution of citrate of iron, maintained at the temperature of 120° by means of a water-bath, stir constantly until it is dissolved.”—*U. S. P.*

My experience is that the process is objectionable in consequence of too great a temperature being employed. Precipitated quinia melts when added to a solution of the above temperature, and forms a gummy, sticky mass, which adheres tenaciously to the stirring spatula and sides of the containing vessel.

When in this form, quinia dissolves very slowly in the solution of citrate of iron.

To obviate this difficulty, reduce the solution of sulphate of quinia to the temperature of 50° before precipitating with ammonia. Wash the precipitate quickly with water of the same temperature. The result will be a light, friable, porous mass, which, when added to the solution of citrate of iron, *also at the temperature of 50°* , will break into small particles when stirred, and quickly dissolve.

When precipitating quinia for other purposes, if cold water is used, the process will be facilitated, for the precipitate can be easily washed without forming a mass and sticking to the filter.

Cincinnati, Ohio.

AN EXPERIMENT ON ANTISEPTICS.

BY M. S. BIDWELL.

November 15th, 1875, a number of wide mouth 8 oz. bottles were prepared, each containing 4 ozs. of water and $\frac{1}{2}$ oz. raw, lean beef. One of these was left without any addition, 20 of them were arranged in sets of four, and to each bottle was added 1, 2, 3 and 4 grs., respectively, of each of the antiseptics under trial, which were carbolic acid (or phenol), salicylic acid, chloral hydrate and benzoic acid. Four sets of bottles were thus occupied. The recent statement, that the alkaline salicylates have no antiseptic power, coupled with the well-known fact, that putrefaction is usually accompanied by an alkaline reaction, suggested the fifth series, containing the same quantities of salicylic acid as in the other series, with the addition of half a drachm of dilute hydrochloric acid to each bottle. Finally, to the twenty-second bottle was added the same amount of hydrochloric acid alone, for comparison. The whole were loosely covered to exclude dust, and set away at the usual temperature of the store, varying from perhaps 55° to 70° . From pressure of business, but little attention was paid to them, and no record was kept of their progressive changes; but, seven weeks later (Jan. 3d, 1876), they were all examined. The following were found more or less putrid, with an offensive ammoniacal odor, much like that of stale urine, viz: The phenol, 1, 2 and 3 grs., salicylic acid the same, benzoic acid 1 gr. and all those containing chloral. In the three containing salicylic acid, the liquid was covered with a thick coating of mould, which was not the case with any of the others, illustrating the fact, which had been previously noticed, that a very small amount of this acid not only does not prevent, but even seems to favor the growth of mould. The bottle containing no antiseptic was, of course, quite offensive, but was not mouldy. The following were free from odor, and apparently unchanged, viz: All that contained salicylic and hydrochloric acids combined, the 2, 3 and 4 grain benzoic acid, the 4 grain phenol, which still preserved, as at first, its slightly carbolic or tarry smell. In all these the water remained clear, or nearly so, the meat having a whitish color and a soaked look. In the sample to which hydrochloric acid alone had been added, the water was clear and inodorous, but had a white, translucent substance, something like coagulated albumen, floating in it. No microscopic examination was made.

From the results of this experiment may be fairly deduced the fol-

lowing conclusions, subject, of course, to correction by further observations :

1. Of the four antiseptics mentioned, benzoic acid is effective in the smallest quantity, phenol and salicylic acids coming next, and being about equal, while chloralhydrate, at least in the ratio of one part in 500, has little or no permanent value.

2. Salicylic and hydrochloric acids combined are more effective than either of the four mentioned. How much of this effect may be due to each, and how much to the combination, could only be determined by further trial, as also how small a quantity of hydrochloric acid would be required. In this experiment, it will be noticed that this was used in about four times the largest quantity of the other agents, as it was not expected to act as an antiseptic, but only to aid the salicylic acid, preventing its extinction by the alkaline products of putrefaction. Yet, if so small a proportion (less than 1 per cent.) of this acid could so effectively retard decomposition, the fact might sometimes be used with advantage, as it would in many cases be convenient and unobjectionable.

One such experiment, of course, settles nothing ; but these results are given for what they are worth, with the hope that others may extend and verify or correct them. The effect of the hydrochloric acid in this case was certainly unexpected by the experimenter, and would seem to suggest further investigation. It will be noticed that the failure of the chloral in this experiment does not at all conflict with the results reported by T. Roberts Baker to the American Pharmaceutical Association at the last meeting, as the weakest solution that he found efficient was 5 grs. to the fluidounce, or 25 times the strength of any used in this case, while he found that a 2 gr. solution only retarded decomposition without permanently preventing it.

Elmira, N. Y., Feb , 1876.

THE BASICITY OF THE PHOSPHORUS ACIDS.

BY R. ROTHER.

Phosphorus, sulphur, arsenic and antimony are possessed of certain common characteristics which indicate a very close relationship between them, and, although various anomalies spring from each particular member of the series, it is nevertheless plain that they virtually effect the transition from metals to metalloids, and from metalloids to the

limitless sphere of the nitrogen and carbon compounds. Phosphorus joins hands, as it were, with the organic and protorganic worlds, constituting a sort of connecting link, forming them into a continuous series.

The acids of phosphorus mark the transition from the mineral to the carbon acids. Their basicity, for this reason, is peculiar, showing the properties of both, and being entirely like neither. Organic or carbon acids are compounds of oxygenated hydrocarbon radicals with hydroxyl. The phosphorus acids are, to a certain extent, analogous to these, hence they may be described as compounds of oxygenated hydrophosphorus radicals with hydroxyl. The definition, however, is not capable of general application, by virtue of the fact that the combined hydrogen is wholly and completely typic in one member of the group, namely, metaphosphoric acid. This acid, however, is the link adjacent to the mineral acids, in which proximity the hydrogen has become wholly typic, and hence the definition is not appropriately applicable in this case.

Assuming that the acids of phosphorus are formed from trihydric phosphide (PH_3) by the interpolation of oxygen, and we have :

Hypophosphorous acid, $\text{PO}_2\text{H}_2=\text{PO}_2\text{H}, \text{H}=\text{POH}_2(\text{OH})$.

Phosphorous acid, $\text{PO}_3\text{H}_3=\text{PO}_3\text{H}, \text{H}_2=\text{POH}(\text{OH})_2$.

Orthophosphoric acid, $\text{PO}_4\text{H}_3=\text{PO}_4, \text{H}_3=\text{PO}(\text{OH})_3$.

But comprehending all the acids, and we have, more fully, thus :

Hypophosphorous acid, $\text{P}_2\text{O}_4\text{H}_6=\text{P}_2\text{O}_4\text{H}_4, \text{H}_2=(\text{PO})_2\text{H}_4(\text{OH})_2$.

Phosphorous acid, $\text{P}_2\text{O}_6\text{H}_6=\text{P}_2\text{O}_6\text{H}_4, \text{H}_2=(\text{PO})_2\text{H}_2(\text{OH})_4$.

Orthophosphoric acid, $\text{P}_2\text{O}_8\text{H}_6=\text{P}_2\text{O}_8, \text{H}_6=(\text{P}_2\text{O}_4)\text{H}_2(\text{OH})_4$.

Pyrophosphoric acid, $\text{P}_2\text{O}_7\text{H}_4=\text{P}_2\text{O}_7, \text{H}_4=(\text{P}_2\text{O}_4)\text{H}(\text{OH})_3$.

Metaphosphoric acid, $\text{P}_2\text{O}_6\text{H}_2=\text{P}_2\text{O}_6, \text{H}_2=(\text{P}_2\text{O}_4)(\text{OH})_2$.

This arrangement reveals a number of very important facts. It shows the regular gradation and development of the series in a most lucid and comprehensive manner, and the gradual evolution from the hydrophosphorus, PH_3 , becomes evident in every member. The relation to the carbon acids is most apparent in the two lowest derivatives, in which the accumulation of oxygen has not entirely overcome the direct contact of phosphorus and hydrogen. In the hypophosphorous acid, only one-third of the combined hydrogen is typic, and in the phosphorous acid two-thirds. The evolution of phosphorus hydrides from either of these two acids by means of heat shows that the whole

of their hydrogen is not replaceable, and that only that portion is typical which is liberated, by means of heat, in combination with oxygen. In the orthophosphoric acid, the accretion of oxygen has so far progressed that the direct contact between phosphorus and hydrogen is no longer maintained, since the balance of affinity now leans strongly towards the oxygen. Heat now expels hydrogen only in combination with oxygen, but no amount of heat can expel more than two-thirds of all the hydrogen combined. The remaining third, constituting the typical hydrogen of metaphosphoric acid is absolutely beyond the direct influence of phosphorus, and the powerful affinity of phosphorus for oxygen, on the one side, and oxygen for hydrogen on the other, retains the compactness of the union beyond the ordinary effects of molecular vibration.

By this arrangement we also discover the appalling inconsistency of the new notation in its treatment of the phosphoric acids. The misconception of the tetrabasicity of pyrophosphoric acid, and the erroneous theory of the trivalent radical phosphoryl, $(PO)'''$, together with the entire new notation of the phosphoric acids, are thereby wholly refuted. Trivalent phosphoryl is utterly inapplicable in case of pyrophosphoric and metaphosphoric acids, as no satisfactory expression can be obtained by its use. It is also plain that a trivalent radical cannot be common to a monobasic, a tribasic and a tetrabasic acid. Furthermore, the inconsistency of the notation must refute itself which represents the three acids thus:

Metaphosphoric acid, $PO_3H=PO_2(OH)$.

Orthophosphoric acid, $PO_4H_3=PO(OH)_3$.

Pyrophosphoric acid, $P_2O_7H_4=P_2O_6(OH)_4$.

Which indicates that there are as many independent radicals as acids, and that while $(PO_3)'$ is univalent, $(PO)'''$ is trivalent and $(P_2O_5)''$ quadrivalent. There is neither sense or reason in such an assumption in view of the fact that the three acids differ from one another by two equivalents of hydroxyl less for every equivalent of oxygen in excess of the radical, P_2O_5 , as is shown by the following:

Metaphosphoric acid, $P_2O_4(OH)_2=P_2O_3(OH)_2O_2$.

Pyrophosphoric acid, $P_2O_5(OH)_4=P_2O_3(OH)_4O$.

Orthophosphoric acid, $P_2O_3(OH)_6=P_2O_3(OH)_6$.

According to the new notation of the phosphoric acids, metaphosphoric acid, (PO_3H) , is first, orthophosphoric acid, (PO_4H_3) , second,

and pyrophosphoric acid, $(P_2O_7H_4)$, third in the series. But, as the first and second members differ by one equivalent of hydroxyl, (OH) , the second and third would vary by the same difference, and hence pyrophosphoric acid under this law should be written PO_5H_4 . This does not, however, agree with facts, as was exhibited by the comparison just preceding.

By the new arrangement as above proposed, which in reality is the natural and true system of notation for the phosphorus acids, being in perfect consonance with the typal theory, all the phosphoric acids contain the bivalent radical phosphoryl, $(P_2O_4)''$, in two cases in combination with partially affected or typoid hydrogen and hydroxyl, and in one wholly in union with hydroxyl. The affected or typoid hydrogen, being yet distantly influenced by the phosphorus of the radical, does not assume the function of hydroxyl, and therefore, particularly in the case of orthophosphoric acid, it ordinarily possesses no salifying power; consequently this affected hydrogen does not virtually represent basicity. It is, however, replaceable by bases, under extraordinary conditions; but in such instances the highly basic character of the compound barely admits of classification as a true salt.

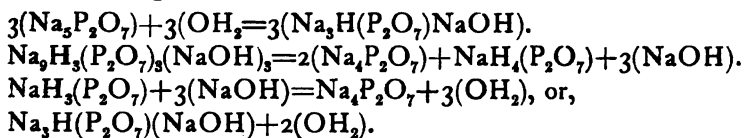
Ignoring the indifferent hydrogen, it will then be seen that metaphosphoric acid is dibasic, pyrophosphoric acid tribasic and orthophosphoric acid tetrabasic. But, admitting the full value of the hydrogen, then metaphosphoric acid remains dibasic, pyrophosphoric acid becomes tetrabasic, and orthophosphoric hexabasic.

For convenience sake, they may be represented as monobasic, dibasic and tribasic. It is, however, atomically correct that they be designated as bibasic, tetrabasic and hexabasic, in which case the tetrabasicity of pyrophosphoric acid, as at present held, would be correct, but in every other instance it would be, typically considered, utterly wrong.

But absolute typic value is the perfect index of basicity, therefore typoid hydrogen is not admissible in a determination of that quality, and as various indications point favorably that way, it appears that the correct basic value of the phosphoric acids is shown by the new arrangement, in which they are respectively dibasic, tribasic and tetrabasic, regardless of typoid hydrogen.

Although fused sodium pyrophosphate is correctly represented by $Na_4(P_2O_7)$, it appears highly probable that the aqueous solution contains it as $Na_3H(P_2O_7)(NaOH)$. This expression, in a measure, ex-

plains the fact why the sodio-ferric pyrophosphate precipitated by alcohol should yield only $2(\text{Na}_4\text{P}_2\text{O}_7)(\text{Fe}_43(\text{P}_2\text{O}_7))$, instead of $3(\text{Na}_4\text{P}_2\text{O}_7)(\text{Fe}_43(\text{P}_2\text{O}_7))$, as which it exists in solution. For if we represent the sodium salt in solution by $3(\text{Na}_3\text{H}(\text{P}_2\text{O}_7)\text{NaOH})$ the first effect of the alcohol will be a tearing away of the exposed alkali; the immediate result of this is the formation of a corresponding amount of acid salt, which also dissolves, while in the mean time the remnant precipitates in the anhydrous condition. The decomposition is clearly illustrated by the following:



AMMONIUM IN DILUTED PHOSPHORIC ACID.

BY HENRY TRIMBLE.

(*Read at the Pharmaceutical Meeting, February 15.*)

The process, recently offered by Prof. Markoe, for making diluted phosphoric acid, has been a fruitful source of controversy among pharmacists during the past few months, and many objections have been advanced, and advantages claimed, with the addition of but few facts to sustain them.

I have endeavored, under the direction of Prof. Maisch, to fully investigate one of these objections, namely, that in reference to the amount of ammonium generated during the process.

Two lots of the acid were prepared, one in the proportion of 12 ounces of nitric acid, 4 cubic centimetres of bromine and 2 ounces of phosphorus. The bromine was dissolved in the nitric acid and the phosphorus afterward added. The reaction commenced at 65°F. , and was allowed to continue until the temperature reached 95° , when the flask was placed in water of 60° , where it remained for 24 hours. The phosphorus not then being entirely dissolved, heat was applied and very gradually increased until it reached 140° , at which degree it was maintained for 2 hours before the solution was completed. The usual process was then employed of heating in a capsule until free from nitric acid, and diluting with water to bring it to the officinal strength. In the second experiment, the same proportions were adopted with the addition of 12 ounces of water. Little or no reaction occurred, unless

the temperature was maintained at from 100° to 130° , and the mixture was finally boiled to dissolve the last portions of phosphorus.

A third sample was obtained from Dr. Pile, who employed no heat in the process, but on the contrary, kept the mixture in cool water until complete solution of the phosphorus was effected. A fourth sample was procured from a fellow-student, C. S. Hallberg, who placed the mixture in cool water for 24 hours, during which time about two-thirds of the phosphorus was dissolved, and then resorted to boiling for completing the solution.

Owing to the impossibility of estimating phosphoric acid by direct saturation, on account of the very gradual change from an acid to an alkaline condition, a seemingly intricate, but practically very simple process was adopted. Half a fluidounce of the diluted acid was supersaturated with caustic soda, and the mixture placed in a small flask, to which was adapted, by means of a tightly fitting cork, a bent glass tube, the end of which was allowed to dip slightly into 10 cubic centimetres of a decinormal solution of oxalic acid. The apparatus was so constructed as to prevent the possibility of any of the alkali passing mechanically into the distillate, and, as a further precaution, preference was given to caustic soda for saturating the acid, so that in case the smallest quantity passed over, it might be detected by the flame test, which, however, in every experiment failed to reveal a trace. Heat was then applied by means of a sand bath, until one-half or more of the liquid had distilled over. To the mixture of the distillate and oxalic acid solution, previously reddened with litmus, was added a decinormal solution of ammonia, the deficiency required for neutralization gave the cubic centimetres of a decinormal solution of ammonia equal to that contained in the diluted phosphoric acid, and, from this, the results in the subjoined table were calculated. With one exception, two experiments were made with each sample, and when there were any differences, which, however, were very slight, an average was taken upon which the calculations were based. From the proportion of phosphorus directed by the Pharmacopœia, there are found to be but 56.90 grains of actual phosphoric acid (H_3PO_4) in each fluidounce. Therefore, the foundation was comparatively small to build the estimation on. The following schedule gives the results, which, small as they may appear, were, nevertheless, readily obtained by the method above described.

No.	Cubic centimetres of decinormal solu- tion of NH_4 found in fl. $\frac{3}{4}$ of Dil. Phos. Acid.	Amount of NH_4 in fl. $\frac{3}{4}$ of Dil. Phos. Acid.	Amount of H_3PO_4 neutralized by N H_4 in fl. $\frac{3}{4}$ Dil. Phos. Acid.	Percentage of H_3 PO_4 combined with NH_4 .	Amount of $(\text{NH}_4)_2$ HPO_4 in fl. $\frac{3}{4}$ Dil. Phos. Acid.	Percentage of $(\text{N}$ $\text{H}_4)_2\text{HPO}_4$ in Dil. Phos. Acid.
No. 1	0.70	.0194 grs.	.0529 grs.	.0926	.0711 grs.	.0147
No. 2	0.20	.0055 "	.0149 "	.0261	.0201 "	.0042
No. 3	1.55	.0430 "	.1170 "	.2056	.1576 "	.0327
No. 4	0.35	.0097 "	.0264 "	.0463	.0355 "	.0073

No. 3 yielded a much larger amount of ammonium than any of the others, which is accounted for by the fact of its having been prepared at a comparatively low temperature.

A moderate heat was employed in the preparation of No. 1, which, therefore, gave a smaller amount, while in the case of Nos. 2 and 4, the boiling temperature was applied, consequently a much smaller yield was obtained.

It is evident that these results are entirely too insignificant to be of any *practical* importance, yet, after all, as has been frequently stated by others, it is difficult to improve on the first process offered by the U. S. Pharmacopœia, against which the principal objection offered is the requisition of constant attention to prevent explosion or breakage; this, however, is not substantiated by the experience, either of myself or those of whom inquiry has been made.

HYDRARGYRUM IODIDUM RUBRUM AND OXIDUM FLAVUM.

BY CHARLES L. MITCHELL.

(Read at the Pharmaceutical Meeting, February 15th.)

The disadvantages arising from the use of mercuric chloride in the preparation of the above-named mercurials have long been known to pharmacutists. Owing to its comparative insolubility in water, a large bulk of liquid is required in order to obtain any appreciable quantity of product, thus necessitating the use of large vessels when manufacturing in any quantity. Heat is also required, in order that the water shall take up as much of the mercuric chloride as possible, and thus lessen the disadvantage of bulky utensils. This, however, only partially removes the difficulty, and runs the additional risk of breakage of vessels, etc. It seems, therefore, that the corrosive sublimate used in the officinal processes for making the red iodide and yellow

oxide of mercury of the U. S. P., could be replaced with considerable advantage by some mercurial salt or preparation possessing the advantages of ready solubility, and concentration in small bulk of a considerable quantity of mercury. For this purpose, I would suggest the mercuric nitrate. It can readily be prepared by dissolving mercury in a slight excess of nitric acid, and then can be used either strong or diluted with water to any degree necessary. For general purposes, the officinal liquor hydrargyri nitratis answers admirably. Two troy ounces of liq. hydrarg. nit. (representing 384 grs. mercury) were diluted with an equal bulk of water, and then 660 grs. of iodide potassium dissolved in f3iv water gradually added, until no farther precipitation took place. The resulting precipitate of red iodide of mercury was collected on a filter, washed with cold water, and then dried. It weighed 868 grs., being a difference of only a few grains from the estimated theoretical yield, and seemed to possess all the qualities of a good article. The manipulations necessary for the preparation of this salt were all conducted in a vessel of 8 ozs. capacity, and with the expenditure of about ten minutes' attention; whereas, if the officinal process had been followed, a vessel at least five times as large would have been required, and considerably more time needed. Another advantage can be also found in the fact that the process is considerably cheaper than that of the U. S. P. In practice, I have found it necessary to use a little more than the theoretical quantity of iodide potassium, in order to allow for moisture in the salt as well as to thoroughly insure the decomposition of the mercuric nitrate. On the other hand, care must be taken not to add a large excess of iodide potassium, on account of the solubility of the mercuric iodide. For preparing the mercuric iodide, I would therefore propose the following formula :

℞					
	Mercury,	.	.	.	1000 grs.
	Nitric acid,	.	.	.	1700 grs.
	Iodide potassium,	.	.	.	1662 grs. or q. s.
	Distilled water,	.	.	.	q. s.

(Instead of the mercury and nitric acid 3v 3i ʒii of liq. hydrarg. nit. can be used.)

Dissolve the mercury in the nitric acid by the aid of a little heat (in large quantities this is not necessary, as the reaction between the acid and mercury generates sufficient heat), and dilute with an equal bulk of water. Then add the iodide potassium, dissolved in 8 fluidounces of

water, until no farther precipitation ensues, being careful towards the last to add the solution very gradually, so as to avoid dissolving the mercuric iodide in an excess of the liquid. Collect the precipitate on a filter, wash well with distilled water, drain and dry.

The solution of mercuric nitrate also affords a very convenient way of preparing the yellow oxide of mercury, and I submit also a formula for its preparation.

Hydrargyrum Oxidum Flar.

R

Sol. mercuric nitrate (prepared by dissolving mercury in an excess of nitric acid),	any convenient quantity
Liq. sodæ,	q. s.

Dilute the solution of mercuric nitrate with an equal bulk of water, and add liq. sodæ until in slight excess. Collect the yellow precipitate, wash well and dry. Sol. soda is used here instead of sol. potassa, as directed by the "Pharmacopœia," on account of its cheapness, there being no appreciable difference in the quality of the yellow oxide obtained from the two solutions.

For these formulæ I do not claim any special originality, but regard them only as affording, by the aid of a very common and easily-made preparation, a much more convenient and practicable method of preparing these mercurials than any other process of which I have knowledge. Their greatest merit lies in the fact that they can be prepared with much economy of both time and space, both important points to pharmacutists whose facilities for manufacturing are of a rather limited character.

ON THE ASSERTED PRESENCE OF TANNIN IN GENTIAN ROOT.

BY JOHN M. MAISCH.

(Read at the Pharmaceutical Meeting, February 15th, 1876.)

The root of *Gentiana lutea*, owing to its importance as a medicine, has been frequently subjected to chemical analysis during the last sixty years, and none of the investigators have been able to prove the presence of tannin in it. The long list commences in 1815, with Schrader ("Berl. Jahrb. f. Phar.," xvi), who is followed by Henry, and by Guillemin and Foecquemine in 1818 ("Jour. de Phar.," v); in 1821 by Henry and Caventou (*ibid.*, vii); in 1836 by Denis (*ibid.*, 1836, January); in 1837 by H. Trommsdorff ("Ann. d. Phar.," xxi), and by Claude

Leconte ("Jour. de Phar.," xxiii); in 1838 by Dulk ("Arch. d. Phar.," xv); in 1847 by Baumert ("Ann. d. Chem. u. Phar.," lxii); in 1861 by H. Ludwig ("Arch. d. Phar.," clvii), and in 1862 by Kromayer (*ibid.*, clx). To these investigations must be added the recent ones by Hlasiwetz and Habermann ("Buchn. N. Repert.," 1874, p. 631; "Amer. Jour. Phar.," 1875, p. 207). It is true that many of these analyses were undertaken with the principal object of isolating the bitter principle or the gentianic (gentisic) acid; but it is hardly to be supposed that a principle like tannin, the presence of which is so readily proven, should have been overlooked. More particularly is this the case with the analyses of Henry and Caventou, Leconte and Dulk, the two former of which were undertaken for the purpose of ascertaining all the constituents, and that of Dulk verified the substantial correctness of the results of the former.

The results obtained by these chemists agree perfectly well with the physiological effects observed by numerous physicians, and which may be summed up with the words of Pereira: "Gentian is very properly regarded as a *pure* or *simple bitter*; that is, as being bitter, but without possessing either astringency or much aroma." Moreover, none of the works on *Materia Medica*, in the English, French and German languages, which the writer had occasion to consult, mentions tannin or a similar compound in this root.

In the face of these numerous investigations, it must appear rather startling to learn that Mr. E. L. Patch, in a paper recently read before the Massachusetts College of Pharmacy, asserted that "he found tannin in the gentian, contrary to the usual statement of works on *Materia Medica*" ("Drug. Circ.," 1876, p. 48). This assertion seems to be mainly based on "the incompatibility of the tincture of chloride of iron and the compound tincture of gentian," although it is stated that Mr. Patch exhibited numerous preparations of gentian in connection with his paper. Unfortunately, the gentleman seems to have overlooked the fact, that the tincture mentioned contains also orange peel, and that the white parenchyma of the latter is colored of a deep black on the addition of solution of any ferric salt, which coloration, according to Flückiger and Hanbury ("Pharmacographia," pages 105, 113), is owing, "*probably*, to a kind of tannic matter." It will be observed that the authors mentioned are very guarded in their expression, notwithstanding the ink-black coloration produced by iron salts.

But what is the effect of ferric salts upon gentian? The investigations mentioned above have thrown considerable light on this point. Henry already noticed the dark color produced by ferric chloride with what he supposed to be the bitter principle, but which was subsequently proven to be merely the yellow coloring principle contained in the root. Baumert says that the concentrated alcoholic solution of pure gentianic (gentisic) acid produces with ferric chloride a red-brown precipitate, and Ludwig found that the aqueous solution of the extract contains a body which, under certain circumstances, imparts a dark-green fluorescence. In these observations we have the key for the behavior of ferric salts with the preparations of gentian, which I shall endeavor to explain with the following experiments.

Well-dried and bruised gentian root was nearly exhausted by cold water, first by percolation and subsequently by expression after maceration. The first portion of the percolate gelatinized on standing a day or two, in consequence of the separation of pectin compounds. This aqueous infusion is not disturbed by gelatin solution, a pretty sure evidence of the total absence of tannin; in the course of a few hours, a scant light-colored precipitate made its appearance, which, after having been thoroughly washed with water is merely tinged light-brown by dilute ferric salts. The infusion, however, strikes with ferric chloride a dark reddish-brown color, which in reflected light shows a deep greenish tint; no precipitate takes place, as the liquid remains perfectly transparent in thin layers, although a concentrated infusion apparently becomes opaque on the addition of the iron salt, but after water is added shows not the slightest sign of a precipitate, even on standing. If the infusion has been previously diluted with water, the addition of ferric chloride will scarcely darken it.

Alcohol added to the cold infusion precipitates pectin compounds, albuminous and gummy matter, and the clear liquid behaves exactly as the infusion from which it had been made. The infusion preserved by alcohol was treated with a fragment of fresh hide for 24 hours; the behavior of the liquid to ferric chloride showed no difference. The experiments detailed prove conclusively that the aqueous infusion of gentian does not contain any tannin.

Gentian root, previously nearly exhausted with water, was now macerated, and then displaced with strong alcohol. The tincture thus obtained is of a bright yellow color, quite distinct from the yellowish-

brown color of the infusion or tincture prepared directly from unexhausted root. It gives, with ferric chloride, a deep brown-green color, and also a precipitate, if sufficiently concentrated; on diluting it with water, the mixture turns muddy from the separation of resin and fat, its color becoming of a dirty green-brown; if, instead of water, alcohol be added to the mixture, a perfect solution is obtained, having a brown color with a greenish tint. The tincture prepared from the nearly exhausted root is, therefore, likewise free from tannin.

In order to further elucidate the subject, a portion of the tincture was evaporated, and the residue washed with cold water to remove the remaining bitter principle, gentiopicrin. The clear, yellow filtrate evidently contains gentianic (gentisic) acid in solution, it yields, with ferric chloride, a deep brown color, without any perceptible green tint. Dilution of the mixture with water revealed the absence of a precipitate.

The yellow granular mass left, after washing the alcoholic extract with water, was washed with cold ether to remove adhering resin and fat; on evaporation of the yellow ethereal solution, a yellow amorphous mass was left, which, dissolved in a little alcohol, yields, with ferric chloride, a dark brown-green precipitate, the mixture becoming muddy on the addition of water, but perfectly transparent by alcohol.

The portion left undissolved by ether, consisting of nearly pure gentianic (gentisic) acid, was recrystallized by hot alcohol; but the quantity operated on being small, the acid was not obtained in an absolutely pure state. Its alcoholic solution behaved nearly like the solution of the ethereal washings, except that the precipitate of the latter with ferric chloride, and its solution in alcohol, was of a more decided green color.

If it is remembered that gentianic (gentisic) acid is slightly soluble in water, not freely in ether, but readily in alcohol, the dark coloration imparted to various simple preparations of gentian by ferric salts is easily explained, likewise the dark-colored precipitate occurring by the same agent with fluid extract of gentian; and if it is remembered that alcohol takes up from gentian root also resin and fat, which are precipitated on the addition of water, the occurrence of a permanent precipitate in the presence of iron apparently remaining on diluting the alcoholic liquid with water, will likewise become obvious.

In proximate analysis it is of the utmost importance not to place any reliance upon any single reaction, much less when the test is applied in such complex mixtures as infusions and tinctures must necessarily be. While it is true that tannins produce, with iron salts, blueish-black or greenish-black colorations or precipitates, according to the state of concentration, it must be borne in mind that there are numerous other compounds which produce somewhat similar reactions, without being in the least related to the interesting group of tannins.

THE READY-MADE PILLS OF OUR DAY.

BY SAMUEL CAMPBELL, OF PHILADELPHIA.

A paper bearing the above title appears in the late Proceedings of the American Pharmaceutical Association, purporting to emanate from the pen of Joseph P. Remington, Professor of Pharmacy in the Philadelphia College of Pharmacy. Any one reading it carefully will find that the written statements and tabulated experiments do not agree as to the awards of merit in his classification of the various ready-made pills of our day. He writes that his tabulated results show the uncoated pill to be the most soluble, next in order the sugar coated pill, then the compressed or lenticular pill, then the gelatin coated pill. Mr. Remington starts out by making up a special uncoated pill, using as an excipient glycerin in both cases, which is not a fair or just criterion of the uncoated ready-made pill of our day. It should have been the regular officinal ready-made pill of the shop, usually made in strict accordance with the ingredients and excipients directed in the United States Pharmacopœia, and kept on hand for immediate dispensing. Mr. Remington then prefers the sugar coated pill as second in point of solubility.

If he will look over his experiments and reflect a moment, he will observe that he should have given the preference to the compressed pills, as it appears in his tables they were the only ones dissolved, all the others were only disintegrated, or as in the case of the cachets de pain the materials were only shaken out, (disintegration does not prove solubility),¹ and in the acidified solution of Pepsin the compressed

¹ We are informed by Professor Remington that the compressed quinia pill dissolves gradually without becoming disintegrated; it, therefore, presents to the liquid of the stomach and intestinal canal a limited surface to act upon, while the uncoated

pills were dissolved in the same time as the sugar coated pills. Again, the compressed compound cathartic pills assert their superiority in becoming disintegrated 15 minutes before the sugar coated pill. In the case of the uncoated compound cathartic pill, Mr. Remington uses the indefinite and impractical expression of "gone in 15 minutes." This implies a perfect solution of the pill, and when we take the ingredients into consideration, we know that they cannot be wholly dissolved in a weak alkaline solution. Another important fact, which Mr. Remington has overlooked, is that a sugar coated pill must first be deprived of its coating before the solvent reaches the pill itself, which he asserts is from 5 to 15 minutes. Two other points in this paper open to criticism are the shaking every 3 minutes, which in the case of the gelatin pills, occupied 18 and 24 hours. Query: How did Mr. Remington manage to shake the pills every 3 minutes during the night? Also, Mr. Remington neglects to state how he maintained a regular temperature of 80° and 98° for that length of time. And in order to further confirm the idea that Mr. Remington really intended to endorse the compressed pills as superior to all other ready-made pills of our day, he represents a machine in a wood-cut at the latter part of his paper, for making a pill that he has published as a third rate pill in point of solubility, which machine I find by tracing its history, is based on a machine found by Professor Remington among the stock which he purchased from the estate of the late A. Mosely, a graduate of our college, and his predecessor in business. Machines made after this model have been offered for sale by different parties, one of them by Messrs. H. C. Blair's Sons, styled the "Remington Pill Press." The machines, *four* of which I have experimented with, and find that they are not practically up to the standard for doing what they represent to do. A pill may be made by the machines with materials of a heavy or moist character, but not so readily with light dry substances, as I found that the machines required cleaning between every one or two pills made, with the chance of breaking them between the *dis*,¹ and in my judgment, endorsed by the and sugar coated quinia pills being disintegrated, present the quinia in the state of powder, and consequently with a very large surface, so that its chances of dissolving rapidly in the stomach, appear to be far better than those of the compressed pill.—*Editor Amer. Jour. Phar.*

¹ I have, however, seen an improvement in one of the machines made at Mr. Remington's suggestion, which obviates the difficulty mentioned, as far as I had time to determine.—S. C.

experience of several pharmacists with whom I have conversed, that the waste of time and labor involved by their use, will ultimately consign them a place among the rubbish of drug stores.

I have thus criticised this paper from the fact that I have been engaged on this subject for some time past, deeming it one of importance to the members of both professions and the community. The following table of experiments were made from the various pills taken from stock on hand in my store, and were conducted conscientiously with a view of arriving at a true solution of which is the best ready-made form of pill for immediate dispensing by the retail pharmacist.

The following list of pills embrace all the known standard ready-made pills of our day, viz. : The officinal ready-made pills ; the soluble pills from Schieffelin & Co., of New York ; the sugar coated pills from many well-known houses ; the gelatin coated pills from Keasbey & Mattison, of Philadelphia and from McKesson & Robbins, of New York ; the compressed pills from Jacob Dunton and John Wyeth & Bro. ; the medicated globules or pearls from E. Fougere & Co., of New York ; also the cachet de pain, a French wafer, first introduced into this city by L. Dursse, of Baltimore, and thence through myself to the medical profession of this city. The points to be considered in such experiments, are the maintenance of a regular temperature, and to get a solution as nearly representing the gastric juice as possible, which, according to the latest authorities on physiology, consists of about 5 parts acid to 15 parts of pepsin, with traces of the chlorides of sodium, potassium, calcium and ammonium ; also phosphates of lime, magnesia and iron, in 1,000 parts of liquid. In my experiments I used a hot water oven, in which heat was maintained at a regular desired temperature, by means of a Bunsen gas regulator as long as required, day and night. The pills were placed in small cylinders of tin, $1\frac{1}{2}$ inches in diameter by $\frac{1}{4}$ inch deep, having gauze bottoms, and suspended in tumblers holding 12 fluidounces. The solvents used were water kept at a steady temperature of 100° Fahrenheit, and a mixture corresponding to the gastric juice, as before described, and previously tested to prove its digestive power by its action upon albumen, also maintained at a temperature of 100° Fahrenheit, with the following tabled results :

Comparative Table, showing the time required for dissolving the different makes of Pills, as enumerated, in water, at 100° Fahrenheit, and in a solution corresponding to the gastric juice, at 100° Fahrenheit.

		Official.		Bullock & Crenshaw. Sugar coated.		McKesson & Robbins. Gelatin coated.		Jacob Dunton. Compressed.	
		Water. Temp., 100°.	Gastric Solution.	Water. Temp., 100°.	Gastric Solution.	Water. Temp., 100°.	Gastric Solution.	Water. Temp., 100°.	Gastric Solution.
Quiniaz Sulph.,	2 grs	24 hours.	70 minutes.	36 hours.	80 minutes.	30 hours.	85 minutes.	24 hours.	25 minutes.
" Bisulph.,	2 "	45 minutes.	20 minutes.	.....	.....	9 hours.	50 minutes.	10 minutes.	7 minutes.
Potass. Iodid.,	5 "	.....	.....	5 hours.	3 hours.	.....	.....	2 minutes.	1½ minute.
Ammon. Murias,	5 "	.....	.....	.....	.....	.....	.....	6 minutes.	4 minutes.
" Carbonas,	5 "	.....	.....	.....	.....	.....	.....	2 minutes.	Instantaneous.
" Bromid.,	1 "	.....	.....	.....	.....	.....	.....	1 minute.	Instantaneous.
Ferri et Quin. Cit.,	5 "	.....	.....	3 hours.	2½ hours.	.....	.....	20 minutes.	13 minutes.
Pepsin. Porci,	5 "	.....	.....	2 hours.	1 hour.	2½ hours.	1½ hour.	90 minutes.	63 minutes.
Dover's Powder,	5 "	.....	.....	.....	.....	2 hours.	.....	60 minutes.	40 minutes.
Cathart. Comp.,	5 "	12 hours.	6 hours.	2 hours.	90 minutes.	20 hours.	15 hours.	10 hours.	6 hours.
Rhei "	5 "	23 hours.	7 hours.	13½ hours.	7¼ hours.	15 hours.	12 hours.	12 hours.	6½ hours.
Rhei,	5 "	3 hours.	2½ hours.	3¼ hours.	3 hours.	10 hours.	8 hours.	2 hours.	90 minutes.
Potass. Bromid.,	5 "	.....	.....	5 hours.	3 hours.	.....	.....	6 minutes.	3 minutes.
Ferri Lact. Comp.,	5 "	.....	.....	4 hrs. 40 mins.	4 hours.	.....	.....	2 hours.	70 minutes.
Aloes et Masticas,	5 "	11 hours.	7 hours.	15 hours.	9 hou s.	12 hours.	8 hours.	10 hours.	6 hours.
Ferri Carb., Quin. and Strych.,	5 "	.....	.....	3 hours.	85 minutes.	.....	.....	2 hours.	65 minutes.

The makes of Pills enumerated above were selected as the best of their kind in the market, and as representing the standard Houses. Where no results are announced, it was from the fact that they could not be procured, or were not made by the parties represented.

I found that all the pills described, with the exception of the Dunton compressed pill, contained excipients of some kind to keep them in pill form.

The Wyeth compressed pill was submitted to same test as the Dunton pill, but required one-fourth longer time to dissolve, whilst the solution of the quinine pills was cloudy, and had a very perceptible

odor of grease, evidencing the fact of the presence of some foreign matter in their composition. The objection that the pressure used in making a compressed pill renders it so compact and hard as to interfere with its solubility, was met by a microscopical examination, which shows that they are quite porous, which fact must practically aid in their solution or disintegration. The soluble pills, so-called, from Schieffelin & Co., of New York, are a handsome-looking pill, but are open to the same objection as the gelatin coated pills, viz., irregularity in dissolving, requiring from 6 to 24 hours, swelling up in some instances as large as raisins, thereby materially interfering with the action of the solvent. The sugar-coated pills were taken from stock recently purchased from Messrs. Bullock & Crenshaw, W. R. Warner & Co. and Hance Bros. & White, all of this city. They required from 15 to 60 minutes to remove the coating, with evidence, in the iodide of potassium pills, of the presence of gum tragacanth and extract of gentian as excipients, swelling up after five hours as large as hazel nuts. The pill proper was, in all cases, hard and brittle, which must necessarily happen on account of the heat employed in coating the pill. Hence is it practical to suppose a sugar-coated pill to be as readily dissolved as one made without coating, with the ingredients merely pressed together without any adherent substance? The globules or pearls from E. Fougere & Co., of New York, are gelatin capsules, with the ingredients in a powdered form, free from excipients, and required from 30 to 60 minutes to dissolve their coating. Their size is an objection, however, yet they include in their list liquids such as apiol, turpentine, ether, phosphorated oil, &c., and the pearls should be classified with Cachet de Pain, and not as pills. They are perfectly reliable, and worthy the attention of the profession. The Cachet de Pain is, no doubt, an elegant mode of giving medicine, yet it is already murmured around by patients that they make a bulky dose.

The method of agitation also engaged my attention, as the one adopted by Mr. Jos. P. Remington to prove the solubility of the pills. I took four $6\frac{1}{4}$ oz. bottles, each containing 4 fluidounces of water at 70° F. In each bottle I placed a 2 gr. sulphate of quinia pill—one made with glycerin as an excipient, another B. & C.'s sugar coated, another McK. & R's gelatin coated, another Dunton's compressed. The bottles were attached to the eccentric rod of an upright steam engine, and speeded up to 350 revolutions a minute, with the following results: The Dunton compressed was dissolved in five hours, the

uncoated in seven hours, the sugar coated in eight hours, the gelatin coated in seven hours. I differ on this point also with Mr. Remington, as the digestive process of the stomach is not agitation, but more properly a churning or a circulatory displacement process, quiet but continuous in its mode of operation; hence my plan of suspending the pills in a large bulk of fluid and allowing the bulkier portion to be below the pills. Hence, after going carefully over the ground described, and as my tabled results will show, I find that in point of solubility the Dunton compressed pill surpasses all others. The second in point of solubility is the uncoated or officinal pill; third, the sugar coated; fourth, the gelatin coated. Although there is some difference between the two latter, yet they may be placed on the same footing, as the fact of their being coated excipient pills must create in the mind of any practical pharmacist or intelligent physician a doubt as to their more rapid solubility over a non-excipient or uncoated pill.

Philadelphia, Feb. 14th, 1876.

ON IODO-SULPHATE OF CHINOIDIN AS AN EXCELLENT RE-
AGENT FOR THE QUALITATIVE AND QUANTITATIVE
DETERMINATION OF QUINIA.

BY DR. J. E. DE VRIJ.

Since I applied Herapath's discovery¹ of the remarkable compound of quinia with iodine and sulphuric acid to the quantitative determination of quinia in a mixture of Cinchona alkaloids,² it has often occurred to me that the use of an alcoholic solution of iodine has many inconveniences, for it requires a great deal of practice to add the *right* quantity. A *slight* excess of iodine is necessary to precipitate all the quinia; but if this excess is too great, a compound containing more iodine is formed, which is very soluble in alcohol. It appeared to me, therefore, desirable to abolish, if possible, the use of free iodine, and to obtain the same result by using a compound of iodine. For this purpose I tried the most soluble of the crystallizable iodo-sulphates described in Herapath's paper, viz., the iodo-sulphate of cinchonina. The alcoholic solution of this compound added to a solution of quinia in alcohol acidulated with sulphuric acid, really produces a precipitate of iodo-sulphate of quinia (herapathite), but the bulk of the reagent required to precipitate all the quinia was too great to answer my pur-

¹ "Pharmaceutical Journal," [1] vol. xi, p. 448, and vol. xii, p. 6.

² "Ibid.," [3] vol. ii, p. 642. "Amer. Jour. Phar.," 1853, p. 137.

pose of applying it to the quantitative determination of quinia. After some experiments with the iodo-sulphate of chiniodin (wrongly called amorphous quinia,) I found that this compound is perfectly adapted for the required purpose, as its solubility in cold alcohol is great enough to make a concentrated alcoholic solution containing 16 per cent. or even more of it. This reagent is made as follows :

Two parts of sulphate of chiniodin,¹ are dissolved in 8 parts of water, containing 5 per cent. of sulphuric acid. To this *clear* solution, contained in a large capsule, a solution of one part of iodine and two parts of iodide of potassium in 100 parts of water, is *slowly* added under continuous stirring, so that no part of the solution of chiniodin comes into contact with an excess of iodine. By this addition, an orange-colored flocculent precipitate is formed of iodo-sulphate of chiniodin, which either spontaneously or by a slight elevation of temperature, collapses into a dark brown-red colored resinous substance, whilst the supernatant liquor becomes clear and slightly yellow-colored. This liquor is poured off,² and the resinous substance is washed by heating it on a water-bath with distilled water. After washing, the resinous substance is heated on the water-bath till all the water has been evaporated. It is then soft and tenacious at the temperature of the water-bath, but becomes hard and brittle after cooling. One part of this substance is now heated with 6 parts of alcohol of 92 or 94 per cent. on a water-bath, and is thus dissolved, and the solution allowed to cool. In cooling, a part of the dissolved substance is separated. The clear dark-colored solution is evaporated on a water-bath, and the residue dissolved in 5 parts of cold alcohol. This second solution leaves a small part of insoluble substance. The clear dark-colored solution obtained by the separation of this insoluble matter, either by decantation or filtration, constitutes the reagent which I have now used since the beginning of 1875, under the name of iodo-sulphate of chiniodin, both for the qualitative and quantitative determination of *crystallizable* quinia.

To determine the quantity of quinia contained in the mixed alkaloids

¹ Identical with "Sulphate of Amorphous Quinia, prepared according to Dr. de Vrij's process, by Messrs. Howard & Sons, Stratford.

² To prevent the use of an excess of iodine, I have prescribed on purpose not enough iodine to precipitate *all* the chiniodin in the form of iodo-sulphate. Therefore this liquor contains still chiniodin which can be obtained in a very pure state, if a little sulphurous acid is added before precipitating the alkaloid by caustic soda.

obtained from a sample of cinchona bark, 1 part of the alkaloids is dissolved in 20 parts of alcohol of 90 or 92 per cent., containing 1.6 per cent.¹ of sulphuric acid, to obtain an alcoholic solution of the acid sulphates of the alkaloids. From this solution, the quinia is separated by adding carefully, by means of a pipette, the above-mentioned solution of iodo-sulphate of chinoidin, as long as a dark brown red precipitate of iodo-sulphate of quinia (herapathite) is formed. As soon as all the quinia has been precipitated, and a *slight* excess of the reagent has been added, the liquor acquires an intense yellow color. The beaker containing the liquor with the precipitate, is now covered by a watch glass and heated on a water-bath till the liquid *begins* to boil.² After cooling, the beaker is weighed, to ascertain the amount of liquid, which is necessary in order to be able to apply later the above-mentioned correction. For although the quinia-herapathite is very little soluble in alcohol, it is not insoluble,³ and, therefore, a correction must be applied for the quantity which has been dissolved both by the alcohol used for the solution of the alkaloids, and the alcohol contained in the reagent. The liquor is now filtered, to collect the iodo-sulphate of quinia, on a small filter, where it is washed with a saturated solution of herapathite in alcohol.⁴ After the washing has been completed, the weight of the funnel with the moist filter is taken, and the filter allowed to dry in the funnel. As soon as it is dry, the weight is taken again to ascertain the amount of solution of herapathite which remained in the filter, and which left the dissolved herapathite on the filter after

¹ This quantity is quite sufficient to transform the alkaloids into acid sulphates, and ought not to be increased, for an excess of acid would increase the solubility of the herapathite in alcohol.

² If during the addition of the reagent to the solution of the mixed alkaloids, the liquid is not continuously stirred, it may happen that, if cinchonidia is present in large proportion relatively to quinia, as in Indian red bark, an orange-colored gelatinous precipitate is formed of an iodo-sulphate of cinchonidia. If this happens, the liquid must be heated till this gelatinous precipitate disappears, before adding more of the reagent to precipitate all the quinia.

³ Alcohol of 92 per cent., saturated with herapathite at a temperature of 24.5° C. left by evaporation 0.133 gram of herapathite.

⁴ For my bark analysis, I always keep a supply of this solution, made by putting an excess of herapathite dried at 100° C. into alcohol of 92 per cent., and shaking from time to time. The temperature of the laboratory in which the analysis is made, is quite indifferent, provided that it is noted and does not change during the operation. It is clear that the amount of herapathite dissolved at that temperature in the alcohol must be ascertained, as this quantity varies with the temperature.

the evaporation of the alcohol. This amount is subtracted from the total amount of liquid, and, for the remaining, the correction is calculated with reference to the temperature of the laboratory during the time of the analysis. The dry iodo-sulphate of quinia is taken from the filter and dried on a water-bath, in one of a couple of large watch-glasses closing tightly upon each other, so that the weight of the substance contained in the glass may be taken without the access of the air. When, after repeatedly ascertaining the weight, it remains constant, this weight is noted down, and to it is added the product of the calculated correction. The sum of this addition is the total amount of iodo-sulphate of quinia obtained from the mixed alkaloids subjected to the operation, and from this weight the amount of *crystallizable* quinia can be calculated by the use of Hauers's formula, $2C_{40}H_{24}N_2O_4, 3(HO, SO_3), 3I$ (old notation), which I have found to be correct. According to this formula, 1 part of iodo-sulphate of quinia dried at $100^\circ C.$ represents 0.5509 part of anhydrous quinia or 0.7345 part of pure commercial disulphate of quinia.¹

The accuracy of this determination may be proved by the following examples :

0.294 gram of anhydrous crystallized quinia, kindly presented to me by Dr. O. Hesse in October, 1873, gave 0.541 gram of herapathite dried at $100^\circ C.$ = 0.298 gram of quinia.

According to Hauers's formula, I ought to have obtained 0.5336 gram of herapathite = 0.294 gram of quinia.

1.048 gram of bitartrate of quinia gave 1.224 gram of herapathite = 0.674 gram of quinia.

According to the formula of the bitartrate $C_{20}H_{24}N_2O_{27}, C_4H_6O_6 + Aq = 492$; 1.048 of bitartrate represent 0.69 of quinia, so that I ought to have obtained 1.255 gram of herapathite.

¹ Although, as Mr. Umney stated at the Pharmaceutical meeting on Wednesday, November 3, 1875, "manufacturers only believed in the crystallizable sulphate of quinia which they could see and weigh," I suppose they will equally be satisfied by seeing and weighing the quinia herapathite obtained by the analyst from a certain amount of bark ; for, not only can this compound be easily distinguished from the similar compounds of the other Cinchona alkaloids, but by dissolving it in sulphurous acid and precipitating the solution by caustic soda, quinia is obtained, which may be easily transformed into crystallized sulphate.

Notwithstanding the different circumstances in which the reagent was applied, the results seem to me satisfactory.

The two following experiments were made with pure quinia, dried at 100° C., at which temperature it still retains water, under identical circumstances :

1.0664 gram of hydrated quinia gave 1.7266 gram of herapathite = 164.5 per cent.

1.055 gram of the *same* hydrated quinia gave 1.7343 gram of herapathite = 164.3 per cent.

Although I feel convinced that this process of estimating the amount of quinia in a mixture of Cinchona alkaloids, is not one which, *even in the hands of inexperienced persons, shall give accurate results in a short time*, I have some hope that in the hands of experienced analysts, it may prove a satisfactory one, if, before applying it, they study, as I have done, the action of the reagent upon solution of 1 gram of quinia, quinidia, cinchonia and of cinchonidia, each of them separately in 20 grams of the above-mentioned acidulated alcohol. If they do so, they will find that the iodo-sulphates of quinia and of quinidia, thus obtained, have an analogous composition, and are identical with the compounds described by Herapath,¹ whilst the iodo-sulphates of cinchonia and cinchonidia have a different composition from the former, and both require more iodine to be transformed into the optical iodo-sulphates described by Herapath. In the meantime, they will find that of all these iodo-sulphates, that of quinia is the most insoluble in alcohol, as has been stated already by Herapath in the paper above quoted, and is therefore precipitated the first of all and *alone* by a *judicious* addition of the iodo sulphate of chinoidin.

I do not in the least pretend to have exhausted the subject, but on the contrary, I hope that my paper may lead to a still better process. Thus, for instance, I feel some hope that it may be possible to apply the alcoholic solution of iodo-sulphate of chinoidin to volumetric analysis, and, therefore, I presented a specimen of it to Mr. Sutton, the author of the valuable work "On Volumetric Analysis," when he was so kind as to call upon me at the Hague last summer.—*The Phar. Jour. and Trans.*, December 11, 1875.

¹ "Proceedings of the Royal Society," vol. ix, p. 10.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Preparation of pure Iodide of Potassium.—If an aqueous solution of potassium iodide, containing iodate, is treated with sulphuretted hydrogen, the iodate is reduced, some sulphuric acid being formed at the same time, so that the iodide may contain 1 to 2 per cent. of sulphate, which may be decomposed by barium iodide. A simpler and more interesting method of purification consists, according to G. Pellagri, in shaking a warm solution of the impure iodide with iron filings, which produces complete reduction of the iodate, no iron being dissolved, nor is iodine found in the ferric oxide formed. In a concentrated solution, the ferric oxide will ultimately exert an oxidizing influence upon the iodide, and the complete reduction of the iodate is only possible if the liquid is filtered and repeatedly treated with fresh iron filings. Complete reduction of the iodate is effected in the cold by immersing in the liquid an iron and a copper plate, and forming them into a galvanic element by uniting them, outside of the liquid, with a wire; the iron only becomes oxidized, but no loss of iodine or contamination with iron or copper takes place. Potassium bromate is likewise promptly reduced by the iron-copper couple, but the chlorate is but incompletely acted upon.

Powdered zinc acts, at first, energetically upon potassium iodate, but does not effect complete reduction — *Schweiz. Woch. f. Pb.* 1875, No 50, from *Ber. Chem. Ges.*

The Devorative Capsules, noticed on page 31 of our January number, appear to be made principally of gelatin. In a warm place, or if handled with moist fingers, they readily become adhesive and lose their gloss, at least in the places touched. They are folded neatly with difficulty only, and are, for the apothecary, very inconvenient, much more so than the wafer capsules, which are readily closed with a very simple apparatus. Another disadvantage of the new capsules is their unsightly appearance, due to their greyish color. — *Ibid.*, No. 51.

Iodinized Cotton.—Cotton, if dipped into a concentrated solution of iodine in ether or carbon bisulphide, retains, after drying, only traces, but no definite amount of iodine. Méhu impregnates cotton with 5 or 10 per cent. of iodine, by sprinkling it over layers of cotton, contained in a bottle, which is then warmed in a horizontal position in a sand or water bath. As soon as the warm air has been expelled, the bottle is tightly closed; the vapors of iodine penetrate the fibres and color the cotton yellow, the color gradually becoming deeper, finally resembling roasted coffee, when the operation, which requires about two hours, is finished. — *Zeitschr. Oesterr. Apoth. Ver.*, 1876, No. 3, from *Jour. de Phar. et de Chim.*

Examination of Volatile Oil of Mustard.—Hager observes that the solubility of this oil, in water, is variable; old oil required only 120, fresh oil about 230 parts of water of medium temperature for solution. Agitated with three times its volume of concentrated sulphuric acid, the mixture remains clear and becomes thick like syrup, after 12 hours, or is converted into a crystalline mass. — *Phar. Cent. Halle*, 1875, No. 43.

Elisa Galeer's liquid for promoting the growth of the hair is a filtered mixture of 15 grams ammonia water, 20 grm. glycerin, 50 grm. alcohol, 10 drops each of the oils of rue, lavender and bergamot, and 200 grms. of water. — *Ibid.*

Insoluble Cement for Glass is obtained, according to Prof. H. Schwarz, by dissolving one part of bichromate of potassium for every 5 parts of gelatin, or glue, in a solution containing from 5 to 10 per cent. of the latter. After having been applied to the glass, the cement, on exposure to the sunlight, loses its property of swelling and dissolving in water, in consequence of the partial reduction of chromic acid.—*Ibid.*, No. 45.

Estimation of Vanillin in Vanilla.—F. Tiemann and W. Haarmann exhaust finely cut vanilla with ether, the solution is somewhat concentrated by evaporation, and then repeatedly agitated with two portions of a mixture consisting of equal volumes of water and concentrated solution of sodium bisulphite. The mixed aqueous solutions, containing the vanillin, are treated with some sulphuric acid, the liberated sulphurous acid is expelled by a moderate heat, and the vanillin extracted by agitation with ether. On the evaporation of the ether, and drying over sulphuric acid, pure vanillin is left behind.

The authors obtained, by this method, from Mexican vanilla 1.69, from Bourbon vanilla 1.91 and 2.48, and from Java vanilla 2.75 per cent. of vanillin, which, in the two last named varieties, is associated with an oil of a disagreeable odor, whereby its flavor is modified.—*Ibid.*, No. 47, from *Ber. Chem. Ges.*

Soluble Blood Powder is obtained, according to G. LeBon, by evaporating the blood under decreased pressure and at a temperature not exceeding that of the body. The author submitted a sample, 18 months old, to the Paris Academy. By agitation with water it was, in a few minutes, converted into a fine red solution, possessing all the properties of defibrinated blood, showing the same behavior in the spectro-scope and coagulating on boiling. It is soluble in an acidulated solution of pepsin, and is recommended as very nourishing.—*Chem. Centralbl.*, 1875, No. 51, from *Compt. rend.*, lxxxii.

A good Copying Ink from Extract of Logwood is obtained by treating 250 grams of coarsely powdered American extract of logwood in a suitable bottle, with 3 kilos distilled water. When this is completely saturated with the soluble coloring matters, say in about one or two weeks, the clear solution is carefully decanted from the sediment, about 20 grams of acetate of manganese, dissolved in a little water, are added to the liquid, the whole is well mixed, and solution of acetate of iron carefully dropped in, until a deep violet-blue color is obtained. It is advisable to set the mixture aside for a few days to ascertain the change of color produced. The ink must be protected from the influence of the sunlight, and instead of gum arabic, solution of dextrin or sugar is preferably added to it.—*Ibid.*, No. 52, from *Ind. Bl.*, xii

Solubility of Oils in Glacial Acetic Acid.—Mr. Barnes' experiments on this subject (see page 29 of January number), were made with an acid solid at 48° F. Mr. W. H. Symons, using acetic acid, remaining solid up to 60° F., found that one volume of it will dissolve in 4 vols. of almond, olive, cod liver and linseed oil, and mix in all proportions with the oils of turpentine and lemon. He also gives the following formulas for

Linimentum Terebinthinae Aceticum: oil of turpentine, 4 fluidounces; glacial acetic acid, solid at 60° F., 1 fluidounce, and camphor liniment, 4 fluidounces.

The following furnishes a liniment which is miscible with spirit in the proportion of one to seven, and with oils in any proportion, and which retains its transparency at a temperature considerably below the freezing point of water: camphor, 240 grains; oil of turpentine, 2 fluidounces; dissolve, filter and add castor oil, 2 fluidounces, and glacial acetic acid, solid at 60° F., 4 fluidrachms.—*Pharm. Jour. and Trans.*, 1875, Oct. 16.

Ammoniacum, according to Prof. W. Dymock, is received, at Bombay, in bales containing all parts of the plant, broken up and encrusted with the gum resin, which appears to exude from every part, even the fruit being coated with it, and to be collected after the plant has matured its fruit. In Bombay it is picked and usually sorted into three qualities, large, middle-sized and small tears, the latter often containing dirt and other refuse. If kept during the monsoon, the tears get soft and unite into a lump.

Dorema root is an article of commerce in Bombay, being imported from Persia under the name of *Boi*, and used in the Parsee fire temples as an incense. It has a thin, papery bark, like sumbul root, but is compact and has a resinous section, its texture becoming loose and spongy by age and the ravages of insects. Some years ago it was sent to Europe as Bombay sumbul, after having been cut up and impregnated with musk.—*Ibid.*, Oct. 23.

Tellurium a probable impurity in bismuth salts.—Mr. Charles Ekin, having called attention to the intolerable smell of garlic imparted to the breath of patients, after having taken a simple bismuth mixture, publishes extracts from some letters, showing that similar observations have been made by others. Mr. Geo. Brownen attributes this effect to the presence of tellurium, and both gentlemen are now engaged in further investigating this subject.—*Ibid.*, Dec. 25.

VARIETIES.

BALSAM PERU ADULTERATED WITH ALCOHOL.—A. Gavalowski recommends the following test as being easier of execution and as reliable as the distillation test: Add a few drops of the balsam to a solution of potassium bichromate in a test-tube, and then add concentrated sulphuric acid. In the presence of alcohol aldehyd will be formed, the smell of which (somewhat similar to that of rotten apples) will be distinctly perceived, since it quite covers that of the balsam itself. Even mere traces of alcohol are said to be recognizable.—*Pharm. Centralb. in Ny pharm. Tid.*, 1875, p. 345.
H. W.

MISTURA GLYCYRRHIZÆ COMPOSITA—A. F. W. Neynaber proposes in the "Druggists' Circular" for February, the following modification of the official formula:

"Take half a troyounce of best Calabria liquorice, cut it into slices about $\frac{1}{4}$ inch thick, introduce it into a glass percolator or funnel, using cotton and linen at the bottom and short straw as a layer between the liquorice, and having closed the out-

let with a cork, provided with a little notch on the tapered end (if the apparatus has no stop-cock), pour upon it 12 fluidounces of cold distilled water, set it aside for 24 hours, then loosen the cork so as to allow the liquid to fall in drops, and let it percolate through, adding water in sufficient quantity until 13 fluidounces have been obtained. To this add half a troy ounce of gum arabic, bruised, stir occasionally, and when it has dissolved, add half a troy ounce of sugar; stir, heat the mixture to the boiling point, strain, and allow it to cool off, adding, if necessary, distilled water to make it weigh 13½ troyounces. To this perfectly clear liquid add camphorated tincture of opium, 2 fluidounces, wine of antimony, 1 fluidounce, spirit of nitrous ether, ½ fluidounce, and mix.

"By this process starch and other impurities will be left behind in the funnel or percolator, the mass retaining almost its original shape (being merely a skeleton), while the liquorice will be exhausted."

It will be observed that this is essentially the same formula suggested by Mr. Wilder on page 97 of our last volume, differing mainly in the recommendation to *boil* the solution of extract, gum and sugar.

LACTOPEPTIN.—The following formula for this preparation is copied from the "Oil, Paint and Drug Reporter," of January 26th:

Sugar of milk,	.	.	.	.	20 ounces
Pepsin, pure,	.	.	.	.	4 ounces
Paucreatin, pure,	.	.	.	.	3 ounces
Ptyalin or diastase,	.	.	.	.	1 drachm
Lactic acid,	.	.	.	.	2½ fl. drachms
Hydrochloric acid,	.	.	.	.	2½ fl. drachms
Powder and mix.					

QUINETUM.—A preparation of the whole alkaloids, separated from East India red bark, has been used for some time in the Indian hospitals, as well as in private practice, with great success. The concurrent testimony of medical men in our Indian possessions is to the effect that quinia is not so greatly superior to the whole alkaloids as to make it worth while to separate the sulphate in its pure state. Mr. Thomas Whiffen, of the Quinine Works, Battersea, now offers to the profession a similar preparation, which he calls quinetum. It is in the form of a fine granular non-adherent powder of a pale buff color. The proportions of the various alkaloids present will, of necessity, vary with the sample of bark used, but we think not so much as to be of moment therapeutically. Sulphate of quinetum is a white crystalline body with a faint pink tinge, greatly resembling sulphate of quinia; and we are informed that the preparation can be supplied to the profession at about one-half of the cost of quinine.—*Medical News*, Jan., 1876, from *Brit. Med. Journ.*, Nov. 27, 1875.

THERMIC RESEARCHES ON PHOSPHORIC ACID. By MM. Berthelot and Louguinine.—M. Thomsen, having repeated the experiments of Graham in 1869 ("Poggendorff's Annalen," cxi, 90 and 94), concluded that phosphoric acid was not a true tribasic acid, but rather a bibasic and triatomic. The authors, having re-ex-

amined this subject, conclude that the three equivalents of base successively united with phosphoric acid are combined in different manners, the first being comparable to the base of the nitrates and chlorates, the second to that of the carbonates and borates, and the third to the base of the alkaline alcoholates.—*Chem. News*, Dec. 31, 1875.

CONSTITUTION OF THE PHOSPHATES. By MM. Berthelot and Louguinine.—In this memoir the authors examine the formation of an insoluble phosphate, that of baryta; they undertake an alkalimetric study of phosphoric acid; and, finally, they seek to define the displacements and reciprocal distribution of an alkaline base among phosphoric acid and the nitric, hydrochloric and acetic acids. They conclude that phosphoric acid is not a tribasic acid of the same kind as citric acid, as the third equivalent of a soluble base is separated from phosphoric acid by the feeblest actions, and even by dilution. With ammonia it happens that the third basic equivalent does not combine with phosphoric acid, or if it combines at first it does not remain definitely united to the acid, but is gradually separated spontaneously and completely. Neither is phosphoric acid a bibasic acid in the same sense as are the sulphuric, oxalic or tartaric acids. The second base, as alkalimetric operations show, is not neutralized by phosphoric acid, and is entirely separated by the hydrochloric and nitric acids, and gives indications of division even with acetic acid. In short, the three equivalents of base united in the phosphates considered as normal, are combined in different and unequal manners. Phosphoric acid must be regarded as a monobasic acid of a mixed function.—*Chem. News*, Jan. 7, from *Compt. Rend.*

AMERICAN QUICKSILVER.—Mr. J. B. Randol, General Manager, gives the production of the New Almaden mine for the year 1875, in flasks of 76½ lbs. each, as follows:

Months.	Flasks.	Months.	Flasks.
January,	850	July,	1,220
February,	800	August,	1,100
March,	1,033	September,	1,200
April,	850	October,	1,250
May,	1,095	November,	1,700
June,	1,050	December,	1,500
Total,			13,648

The total product of the mine for 1874 was 9,084 flasks, making the increase this year 4,564 flasks, or nearly 50 per cent.—*Scientific American*, Feb. 26, 1876.

CONSTITUENTS OF WOOD-TAR CREASOTE. By Ferd. Tiemann and Benno Mendelsohn.—The portion of Rhenish wood-tar creasote boiling at 200°–230°, was dissolved in ether and the solution agitated with potash. The aqueous liquid, after separation from the ether, was acidified, and the oil thereby liberated was separated by fractional distillation into two portions boiling at 195°–212° and 217°–226° respectively. The latter consisted of phlorol and creosol.

Methylcreosol (Dimethylhomopyrocatechin).—This body was obtained thus: The

foregoing mixture of phlorol and creosol, dissolved in alcohol and mixed with a slight excess of potash, was evaporated till it began to crystallize, and the crude creosol-potassium salt thereby formed was dissolved in methyl alcohol and boiled with excess of methyl iodide. The product was a dense oily body, distilling for the most part at 214° — 218° .

Methylcreosol is a transparent, heavy liquid, of not unpleasant odor when pure, insoluble in water and dilute alkalis, but easily soluble in alcohol and ether.

Dimethylprotocatechuic Acid.—Methylcreosol was oxidized by heating it with a dilute solution of potassium permanganate. The product was an acid, crystallizing in long prisms, dissolving sparingly in water and freely in alcohol and ether, melting at 174° , and having the composition of dimethoxybenzoic acid. By gentle fusion with potassium hydrate it was converted into pyrocatechuic acid. This decomposition and its melting point characterize the body as dimethylprotocatechuic acid.

Creosol is therefore a derivative of protocatechuic acid, and must be regarded as methylated methylpyrocatechin or homoguaiacol.

Indifferent Oils of Wood-tar Creasote.—The etherial solution above mentioned contained an oil boiling at 214° — 218° , which was separated by fractional distillation. This body yielded by oxidation dimethylpyrocatechuic acid, and therefore consisted of methylcreosol or dimethylhomopyrocatechin. Other oils present in the etherial solution are being examined by the authors.—*Journ. Chem. Soc. [Lond.]*, Jan., 1876, from *Deut. Chem. Ges. Ber.*, viii, 1136—1139.

REACTIONS OF SACCHARINE MATTERS. By M. Vidau.—A mixture of equal parts of commercial hydrochloric acid and of a fatty oil, but especially of oil of sesame, is a very delicate test for sugar, glucose, levulose, honey, &c. The oil and acid are shaken together for some minutes, and the mixture is heated until the acid liquid begins to boil, then the acid is allowed to subside and its color is observed. When oil of sesame is used, the subsequent addition of one-tenth of a milligram of inverted sugar suffices to produce a characteristic rose color. The reaction is distinct with a liquid containing one 20,000th of inverted sugar, and detects a milligram of that substance when dissolved in a cubic centimeter of normal urine.—*Ibid.*, from *J. Pharm. Chim.*, [4], xxii, 33.

A NEW PREPARATION OF SANTONIN.—Albuminated sodium santonate has recently been much recommended as an anthelmintic. It is prepared by gently heating in a porcelain dish a mixture of four parts of sodium bicarbonate, one part of santonin and two parts of dried, soluble egg or blood albumen with a small quantity of water, until a solution is effected; this is evaporated to dryness and subsequently redissolved in a sufficient quantity of warm water; the filtered solution is evaporated, at a gentle heat, to dryness. The remaining albuminated sodium santonate forms colorless, shining scales, readily soluble in water, rendering an alkaline solution which, upon addition of acids, separates santonin with the evolution of carbonic acid from an excess of sodium carbonate.—*Med. and Surg. Reporter*, Feb. 19, 1876.

PHARMACOPŒIA OF THE PHILADELPHIA HOSPITAL. (Concluded.)—

Linimentum Terebinthinæ Compositum.

R Olei terebinthinæ,
Aquæ ammoniæ fortioris, aa f̄zi
Linimenti saponis, f̄ziv
Fiat linimentum.

Liquor Bromini.

R Bromini, ʒi
Aquæ, f̄zii
Potassii bromidi, q. s. ut fiat solutio.
Signa—For physicians' use only.

Liquor Plumbi Subacetatis cum Opii.
(Lead-water and Laudanum.)

R Tincturæ opii, f̄zii
Liquoris plumbi subacetatis diluti, f̄zii
q. s. ad Oii
Misce.

Mistura Antirheumatica

R Potassii nitratis, ʒi
Vini colchici radices, f̄zi
Spiritus ætheris nitrosi, f̄zi
Syrupi guaiaci, f̄zii
Olei gaultheriæ, gtt. vi
Aquæ, q. s. ad f̄zvi
Misce. Signa—Dose, a tablespoonful every two hours.

Mistura Arsenicalis Composita.

R Liquoris arsenici chloridi, f̄zss
Tincturæ ferri chloridi, f̄ziiss
Cinchoniæ sulphatis, ʒii
Strychniæ sulphatis, gr. ii
Syrupi, f̄zvi
Aquæ, aa q. s. ad f̄zvi
Fiat mistura Signa—Dose, a teaspoonful.

Mistura Astringens.

R Acidi sulphurici aromatici, f̄zii
Extracti hæmatoxyli, ʒii
Tincturæ opii camphoratæ f̄zss
Syrupi zingiberis, q. s. ad f̄zvi
Misce secundem artem. Signa—Dose, a tablespoonful.

Mistura Cosmetica.

(Goddard's Cosmetic Lotion.)

R Tincturæ benzoini, f̄zii
Hydrargyri chloridi corrosivi, gr. vi
Aquæ rosæ, f̄zvi
Fiat mistura.

Mistura Cretæ Composita.

R Tincturæ catechu,
Tincturæ opii camphoratæ, aa f̄zvi
Acidi carbolici, gtt. xii
Mistura cretæ, q. s. ad f̄zvi
Misce secundum artem. Signa—Dose, a tablespoonful.

Mistura Ferri Chloridi Composita.
(Basham's Mixture.)

R Liquoris ammonii acetatis, f̄zii
Tincturæ ferri chloridi, f̄ziiiss
Acidi acetici diluti, f̄zi
Curacoa vel alcohol, f̄zii
Syrupi,
Aquæ, aa q. s. ad f̄zvi
Fiat mistura. Signa—Dose, a tablespoonful.

Mistura Ferri cum Quiniæ.

R Quiniæ sulphatis, ʒi
Acidi phosphorici diluti, q. s.
Ferri pyrophosphatis, ʒss
Mistura aromaticæ, q. s. ad f̄zxxx
Misce secundum artem. Signa—Dose, a tablespoonful, containing 1 gr. of quinia and 4 grs. of iron.

Mistura Sodæ.
(Soda Mint.)

R Sodii bicarbonatis, ʒii
Spiritus ammonii aromatici, gtt. [xxxvi]
Aquæ menthæ viridis, f̄zvi
Misce. Signa—Dose, one or two tablespoonfuls three times a day.

Mistura Sodæ Composita.

R Sodii bicarbonatis, ʒii
Creasoti, gtt. xii
Syrupi acaciæ, f̄zii
Spiritus lavandulæ compositi, f̄ziiss
Aquæ, q. s. ad f̄zvi
Fiat mistura. Signa—Dose, a tablespoonful two hours after meals.

Mistura Zollickofferi.
(Zollickoffer's Mixture.)

R Potassii iodidi,
Pulveris guaiaci resinæ, aa ʒiiss
Vini colchici radices, f̄ziiss
Aquæ cinnamomi,
Syrupi, aa q. s. ad Oii
Fiat mistura. Signa—Dose, a tablespoonful.

Chlorodyne.

- R Chloroformi, f3ss
 Spiritus ætheris sulphurici, f3iss
 Olei menthæ piperitæ, gtt. viii
 Oleoresinæ capsici, gtt. ii
 Extracti cannabis indicæ, gr. vi
 Morphine muriatis, gr. xvi
 Acidi hydrocyanici diluti, m℥xv
 Acidi hydrochlorici diluti, f3i
 Glycerinæ,
 Mellis, aa q. s. ad f3iv
 Fiat mistura secundum artem. Signa—
 Dose, 15 to 20 drops.

Pilulæ Aloes Compositæ.

- R Pulveris Aloes Socotrinæ, 3ss
 Ferri sulphatis exsiccata, aa 3ii
 Terebinthinæ albæ, aa 3ii
 Misce et fiant pilulæ cxx.
 Signa—Each pill contains 2 grs. of
 aloes and one gr. each of iron sulphate
 and turpentine.

Pilulæ Antineuralgicæ.

- Acidi arseniosi, gr. iv
 Strychniæ sulphatis, gr. iii
 Extracti belladonnæ, gr. xxiv
 Cinchonix sulphatis, 3iii
 Pilulæ ferri carbonatis, 3v
 Misce, et fiant pilulæ cxx.
 Signa—Each pill contains 1-30th gr.
 of arsenic, 1-40th gr. of strychnia, 1-5th
 gr. of belladonna, 1½ gr. of cinchonia,
 and 2½ gr. of Vallet's mass.

Pilulæ Cinchonix et Arsenici.

- R Cinchonix sulphatis,
 Ferri redacti, aa 3ss
 Extracti nucis vomicæ, gr. xxx
 Acidi arseniosi, gr. vi
 Misce, et fiant pilulæ cxx.
 Signa—Each pill contains 1-20th gr.
 of arsenic, ¼ gr. of nux vomica, and 2
 grs. each of iron and cinchonia.

Pilulæ Colocynthis cum Belladonnæ.

- R Extracti belladonnæ, gr. xv
 Extracti colocynthis compositi,
 Pulveris aloes socotrinæ, aa 3iii
 Olei anisi, gtt. xxx
 Misce, et fiant pilulæ cxx.
 Signa—Each pill contains ½ gr. of
 belladonna, and 1½ grs. each of aloes
 and colocynth.

Pilulæ Cinchonix Compositæ.

- R Cinchonix sulphatis,
 Ferri redacti, aa 3ss
 Extracti nucis vomicæ, gr. xxx
 Misce, et fiant pilulæ cxx.
 Signa—Each pill contains ½ gr. of nux
 vomica and 2 grs. each of iron and
 cinchonia.

Pilulæ Opii cum Plumbi Acetate.

- R Pulveris opii, gr. xl
 Plumbi acetatis, 3ss
 Misce, et fiant pilulæ cxx. Signa—Each
 pill contains ½ gr. of opium, and 2 grs.
 of acetate of lead.

Pilulæ Podophylli Compositæ.

- R Resinæ podophylli, gr. xx
 Extracti colocynthis compositi,
 Extracti hyoscyami, aa 3ii
 Misce, et fiant pilulæ cxx.
 Signa—Each pill contains 1-6th gr. po-
 dophyllin, and 1 gr. each of colocynth
 and hyoscyamus.

Pilulæ Rhei et Gentianæ.

- R Pulveris rhei, 3ss
 Extracti gentianæ,
 Extracti hyoscyami, aa 3ii
 Misce, et fiant pilulæ cxx. Signa—Each
 pill contains 2 grs. of rhubarb, and
 1 gr. each of gentian and hyoscyamus.

Pulvis Glycyrrhizæ Compositus.

- R Pulveris sennæ,
 Pulveris glycyrrhizæ radices, aa 3vi
 Pulveris fœniculi,
 Sulphuris loti, aa 3iii
 Sacchari albi, 3xviii
 Misce. Signa—Dose, a teaspoonful at
 bed-time.

Pulvis Sodæ Compositus.

R Bismuthi subnitratis, gr. v
 Sodii bicarbonatis,
 Pulveris zingiberis,
 Pulveris calumbæ, aa gr. iiss

Misce.

Syrupus Chlorali.

R Chloralis hydratis, ℥xiv
 Tincturæ cardamomi, fʒi
 Syrupi, fʒiv
 Aquæ cinnamomi, q. s. ad Oi

Misce. Signa.—A teaspoonful contains 10 grs. of chloral.

Syrupus Guaiaci.

R Pulveris guaiaci resinæ, ℥xxxii
 Liqueoris potassæ, fʒss
 Sacchari albi, lbi, (avoird.)
 Aquæ, fʒviii

Fiat syrupus. Signa—Dose, a teaspoonful, containing 5 grs. of guaiacum.

Syrupus Pectoralis.

R Ammonii chloridi, ʒss
 Syrupi senegæ, fʒi
 Misturæ glycyrrhizæ compositæ, q. s.
 [ad fʒviii]

Misce. Signa—Dose, a dessert-spoonful.

Syrupus Potassii Iodidi.

R Potassii iodidi, ʒi
 Syrupi sarsaparillæ compositi, q. s.
 [ad fʒvi]

Misce. Signa—Dose, a dessert-spoonful, containing 20 grs. of iodide.

Syrupus Potassii Iodidi Compositus.

R Hydrargyri chloridi corrosivi, gr. ii
 Potassii iodidi, ʒi
 Syrupi sarsaparillæ compositi, q. s.
 [ad fʒvi]

Misce. Signa—Dose, a dessert-spoonful, containing 1-12 gr. of mercury, and 20 grs. of potassium iodide.

Tinctura Aromatica.

R Coriandri fructus, ʒii
 Angelicæ fructus, ʒiiss
 Glycerinæ, fʒv
 Syrupi, fʒvi
 Alcoholis diluti, q. s. ut fiant tinctura,
 Oii

Signa—A pleasant vehicle for administering nauseous remedies.

Tinctura Ferri Composita.

R Cinchoniz sulphatis, ʒi
 Strychniz sulphatis, gr. ii
 Tincturæ ferri chloridi, fʒi
 Syrupi,
 Aquæ, aa q. s. ad fʒviii

Misce secundum artem. Signa—Dose, a teaspoonful 3 times a day.

Tinctura Saponis Viridis cum Pice.

R Picis liquidæ,
 Saponis viridis,
 Spiritus methylici, aa ʒi
 Misce cum leni colore.

Tinctura Styptica.

R Potassii carbonatis, ʒi
 Saponis, ʒii
 Alcoholis, fʒiv
 Fiat mistura secundum artem.

Unguentum Plumbi Oxidi.

R Emplastri plumbi, ʒi
 Olei olivæ, fʒii
 Misce cum leni calore.

Unguentum Zinci Oxidi Benzoatum.

R Zinci oxidi, ʒi
 Tincturæ benzoini, gtt. xl
 Adipis, ʒvii
 Fiat unguentum.

MINUTES OF THE PHARMACEUTICAL MEETING.

The meeting was called to order at 8.15 P. M. The President and Registrar being absent, their offices were filled by the election of Mr. A. P. Brown and Richard V. Mattison to their respective positions.

The minutes of the previous meeting were read, corrected and approved, the correction being that the glycerin dropper, exhibited at our last meeting, was not the invention of Mr. Bowman, but of Mr. H. W. Wharton, of Nashville, Tenn. (See p. 99).

Prof. J. M. Maisch presented, from the British Pharmaceutical Conference, "The Year Book of Pharmacy," and also a pamphlet, by Prof. Mark W. Harrington, of the University of Michigan, on "The microscopic examination of crude drugs," which were accepted with the thanks of the meeting.

Prof. Maisch then presented a specimen of nut galls, forwarded from Texas, by Mr. Voelcker, of New Braunfels. They resemble, in structure, Aleppo nut galls, differing, however, in being lighter in color, having a smoother surface and containing less tannin.

Prof. Maisch also presented a handsome specimen of monobromated camphor, prepared by Mr. T. C. Linthicum, a member of the present class.

Mr. Morris, of Edw'd S. Morris & Co., was then introduced, and presented specimens of palm nuts, from which palm oil is obtained; also, palm oil, made from the pulp around the kernel, of a reddish orange color, and also a white oil, obtained from the kernels themselves. A specimen of palm soap, made in Liberia, from the fresh oil, by this firm, was then exhibited, and specimens of coffee, the entire fruit, from Liberia and Brazil, donated to the cabinet.

Mr. Morris then spoke of the manufacture of indigo, as prepared by his firm; instead of exposing the juice to the air, as usually practiced, they force air, by a steam pump, directly into the expressed juice of the plants, thus allowing oxidation to proceed with great rapidity, with the consequent great saving of time and labor, the granulated precipitate of indigo is then spread upon trays, and dried by means of hot air.

Mr. Trimble read a paper on "The presence of ammonium in phosphoric acid," prepared by Prof. Markoe's process, (see p. 113), the conclusions of the writer being that the amount of ammonia formed is so small as to be of no practical importance. Some remarks followed, in which Prof. Markoe's process was warmly commended, no objection, however, being found to the first process of the Pharmacopoeia.

Mr. Chas. L. Mitchell read a paper on the preparation of the red iodide and yellow oxide of Mercury (see p. 115), and exhibited specimens prepared by the processes recommended. Prof. Maisch said that in case of the mercuric iodide, the use of mercuric nitrate had been objected to, owing to the free nitric acid necessary to keep the nitrate in solution, tending to liberate iodine; Mr. Mitchell's manipulation, however, seems to obviate this difficulty, the specimen exhibited appearing to be unobjectionable.

Prof. Maisch then read an interesting and valuable paper on "The asserted presence of tannin in gentian root," clearly showing the absence of tannic acid in this drug (see p. 117). The infusion is not at once precipitated by gelatin, and yields, with a chemically neutral solution of ferric chloride, a blackish color, due to gentisic acid, and to a body producing a green fluorescence, the color being, of course, destroyed by an acid from the decomposition of the ferric gentianate.

The papers were accepted and referred. Some discussion ensuing in regard to the time of holding the meetings; on motion it was decided to hold the next meeting on March 21st, at 3 P. M.

On motion, the meeting then adjourned.

RICHARD V. MATTISON, *Registrar, pro tem.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

THE CONNECTICUT PHARMACEUTICAL ASSOCIATION was organized at New Haven, February 9th, nine cities and towns being represented by 30 apothecaries. A Constitution and By-laws were adopted, and the following officers elected for the ensuing year: President, N. Dikeman, of Waterbury; Vice-Presidents, H. H. Osgood, of Norwich, and Henry Woodward, of Middletown; Secretary, Alfred Daggett, of New Haven, and Treasurer, G. P. Chandler, of Hartford. An Executive Committee and a Committee on Queries were appointed, and the following delegates chosen to represent the new association at the next meeting of the American Pharmaceutical Association in September next: Samuel Noyes, New Haven; A. F. Wood, New Haven; S. R. McNary, Hartford; W. W. Mosher, West Meriden; Henry Woodward, Middletown. The annual meeting will be held in the city of Hartford on the first Wednesday of February, 1877.

THE NEW HAMPSHIRE PHARMACEUTICAL ASSOCIATION held its second annual meeting in Manchester, on October 12th, Mr. Chas. S. Eastman, of Concord, in the chair. The proceedings, an account of which we have received in a neatly-printed pamphlet covering 48 pages, consisted in the reading of the officers' reports and discussions on the Pharmacy Law of the State and on apprenticeship, besides the usual routine business. The officers for the present year are Chas. F. Hildreth, of Suncook, President; P. J. Noyes, of Lancaster, and B. B. Weeks, of Manchester, Vice-Presidents; H. B. Foster, of Concord, Treasurer; G. F. Underhill, of Concord, Secretary; T. L. Smith, of Dover, Auditor, and P. J. Noyes, Reporter on the Progress of Pharmacy. The delegation to the next meeting of the American Pharmaceutical Association consists of Messrs. Geo. F. Underhill, Chas. S. Eastman, Chas. F. Hildreth, H. B. Foster and Thos. L. Smith. The Association, whose next annual meeting will convene in Nashua on the first Tuesday of October, has 87 members and 23 honorary members, six of the latter residing in Europe.

THE NEW YORK ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY met February 1st. After transacting the usual business, Mr. Plummer spoke of the generally bad condition in which herbs are found in most retail stores, especially in the smaller ones, and such herbs as have but little demand. He stated that they are not unfrequently kept until they become thoroughly musty and mouldy, and, though once pressed, become loose, and exhibit the change so much as to entirely efface the labels. In many stores in this city and throughout the country, drugs of this character could be found which have been in stock for a number of

years, and are yet offered for sale. There ought to be a limit to the practice, as there are but few botanical drugs which do not deteriorate by time and exposure. This class of drugs is not so important a department of the pharmacist's stock as formerly, yet it behooves us to be guarded as to the quality of all drugs passing through our hands, and it ought to be somebody's business to look after it.

Mr. Messing said, if parties engaged in putting up herbs, etc., were required to print the date of growth on each package, it would be an important precaution. Most druggists thoughtlessly allow an old stock of herbs to accumulate, forgetting their age; but he thought it not warrantable in any case that they be kept longer than two to five years, even in proper receptacles, while many druggists keep them in paper or cigar boxes or loosely piled upon shelves. It was suggested that the remarks would as well apply to some pharmaceutical preparations which, being little used, stand on the shelves for years, becoming entirely unfit for use, yet they are dispensed. The appointment, by the College of Pharmacy or by the Board of Health, of an inspector was suggested, who should be an expert of recognized ability, and vested with power to condemn all drugs which, after faithful examination, prove to be inert, sophisticated or adulterated. The report of the Committee on Adulterations and Sophistications, made at the last meeting of the American Pharmaceutical Association, shows that quite a variety of such drugs find their way into the pharmacies, either through the ignorance or carelessness of pharmacists. The discussion was extended to some length, bringing out many interesting facts upon this important subject, showing that many drugs pass through our market that would be much more fitting in accompaniment with the wares of Shakespeare's woe-begotten apothecary of Mantua than to the stock of an American pharmacy.

The next meeting will be held Tuesday evening, March 7th, when nominations are to be made for officers for the ensuing year.

THE MARYLAND COLLEGE OF PHARMACY held a pharmaceutical meeting, February 16th, at which Mr. W. S. Thompson read a paper on hydrobromic acid, and Mr. J. F. Hancock one on saffron, giving a sketch of its history, &c. We are pleased to learn that this College has purchased from the city of Baltimore one of the school-houses, which is located in a pleasant and quiet neighborhood, and has a lot 74 feet front by 110 feet deep.

CINCINNATI COLLEGE OF PHARMACY.—The first pharmaceutical meeting for the year 1876 was held February 9th, President Eaton in the chair. The attendance was unusually large, and much interest was manifested. Prof. Judge gave the result of his experiments on discolored syrup of iodide of iron, and recommended hypophosphorous acid as the agent to restore the altered syrup, in preference to hyposulphite of sodium, which, on being added to discolored syrup, passes into sodium sulphate, and precipitates one-half of the sulphur it contains, leaving the syrup as unpleasant in appearance as before the addition. Hypophosphorous acid, having the same affinity for oxygen, would effect the same change as the hyposulphite, leaving, however, the syrup clear and of the proper color.

Prof. E. S. Wayne exhibited a specimen of Indian mallow (*Abutilon Avicennæ*) nat. ord. Malvaceæ, which is a troublesome weed. Paper, he remarked, was made

from the whole stock of the plant, which yielded also an excellent flax-like fibre, that had been woven into fabrics and made into twine and cordage. The Professor presented to the cabinet a beautiful specimen of "chimaphilin," and three specimens of true balsam of copaiva.

On motion, thanks were returned for the donations and remarks. Adjourned, to meet March 8th, 1876, at 3 o'clock P. M. LOUIS SCHWAB, Cor. Sec.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—President T. H. Hills occupied the chair at the pharmaceutical meeting held February 2d. Mr. James Deane read a paper entitled "The best form of blistering liquid" The *Liquor epispasticus*, Br.P., is made by incorporating 4 fluidounces of acetic acid with 8 oz. of powdered cantharides, and percolate the mixture, after 24 hours, with ether, until 20 fluidounces are obtained; from 2 fluidounces of this preparation 0.8 grains of cantharidin were obtained. Exhausting the cantharides with sufficient acetic ether to obtain 20 fluidounces of percolate, 2.2 grains of slightly impure cantharidin were obtained from 2 fluidounces. The same amount of another preparation, made by moistening the cantharides with a solution of glacial acetic acid in ether, and percolating with ether, yielded 1.8 grains of cantharidin; 350 grains of cantharides, representing 2 fluidounces of the above liquids, yielded 2 grs. of pure cantharidin. The author is therefore in favor of one of the last two menstrua, the question as to which is the better being medical rather than pharmaceutical. The officinal preparation being stronger than necessary, a reduction of the powdered cantharides to 4 or 5 ounces is advocated.

Mr. Harold Senier read a paper on "The Composition of Pilula Hydrargyri, Br.P." A number of samples were analyzed, with the view of determining the amount of metallic mercury and of mercurous and mercuric oxides. The results showed that the latter gradually increased in quantity with the age of the blue mass, which, 18 hours after preparation, was found to contain but a trace of mercurous oxide; after three months, .24 per cent. mercuric and .62 per cent. mercurous oxides were obtained, and in another sample, .44 and 1.60 per cent. respectively. After two years, 1.80 mercuric and 4.22 mercurous oxides were present. The amount of mercury in the nine samples examined corresponded with the requirements of the "Pharmacopœia."

In the discussion following, Professor Redwood called attention to his researches, made 14 or 15 years ago, upon Hydrargyrum cum cretâ, which was found to be more rapidly oxidized than blue mass, particularly if made by machinery instead of in the mortar. Mr. Greenish referred to the paper of Dr. Squibb ("Amer. Jour. Phar.," 1857, p. 388), in which the proneness to the oxidation of mercury in Hydrarg. c. cret. is attributed to its often being too finely divided.

Mr. John Moss read a paper on *Vaseline*, showing that this term must be regarded as a distinctive name for a mixture of paraffins obtained by a known process, and recommended as a substitute for lard and other similar substances for pharmaceutical purposes.

Mr. A. W. Gerrard followed with a paper in which he favored the preparation of suppositories, using four parts of vaselin and one of paraffin as a base. The advantages over cacao butter are that the former melts slowly into an unctuous mass, which is cleanly and causes no inconvenience to the patient; that it does not become

rancid, and that owing to its great power of contraction the suppositories leave the moulds with greater ease.

Preparations made with vaselin were shown by several gentlemen. Considerable difference of opinion was expressed as to the adaptibility of paraffin mixtures for suppositories. Messrs. Allchin and Williams opposed the use of paraffins in ointments, because they would not be absorbed by the skin, in which respect lard was by far superior.

EDITORIAL DEPARTMENT.

CENTENNIAL BUREAU.—It will be of interest to those of our readers who contemplate exhibiting goods at the approaching international exposition, to learn that the house of Peter Wright & Sons, agents for the transatlantic steamers running to Philadelphia, has established a bureau for the purpose of attending to the interests of exhibitors, and will undertake the transportation of goods from Liverpool or Antwerp, their reception at this port, their proper installation, the general care during the exposition, their disposal or repacking and return. The labor will be divided among experts and firms of acknowledged reputation in the leading departments of industry and arts, Messrs. Bullock & Crenshaw taking charge of drugs, chemicals, chemical apparatus and perfumery. If it is desired, competent persons will be engaged to give their exclusive time to the exhibition and explanation of goods.

Having received several inquiries in regard to such or similar arrangements, it is likely that other readers of the "Journal," in this and foreign countries, may avail themselves of such an opportunity.

FEMALE APOTHECARIES.—During the past session two ladies have been attending the lectures at the Philadelphia College of Pharmacy. At the December examination of the Pharmaceutical Society of Great Britain, Isabella Skinner Clarke passed the major examination, and was duly registered as "Pharmaceutical Chemist."

THE GROWTH AND USES OF BENZOIN.—Under this title, our last number contained an essay which was duly credited to the journal in which we found it published, without reference to any other source. Our thanks are due to several correspondents who called our attention to the fact that the paper in question is almost literally copied from Flückiger and Hanbury's "Pharmacographia," and should, therefore, be credited to that excellent work.

PANCREATIN.—The last volume of the "Proceedings of the American Pharmaceutical Association" contains an interesting paper on this subject, from the pen of Prof. E. Scheffer, of Louisville. In the last sentence on page 731 we find a typographical error, whereby the author is made to say the opposite of what the results of his experiments point to; the sentence in question should read: "The foregoing experiments . . . prove the *uselessness* (not usefulness) of pancreatin as a therapeutical agent, as it will be decomposed when brought into the stomach."

THE AMERICAN JOURNAL OF PHARMACY.

APRIL, 1876.

ASSAY OF ATROPIA IN EXTRACTS OF BELLADONNA.

BY JOSEPH LE ROY WEBBER, PH.G.

(Extract from an Inaugural Essay.)

In order to determine the relative value of inspissated juices and alcoholic narcotic extracts, commercial and officinal, an assay of the alkaloid in one of the most important of this class, namely, the extract of belladonna, was made with care and accuracy.

Extracts of belladonna were purchased, representing the principal houses of this country, and those of Europe which have a very extended sale in this country. When purchased, each package had on it the manufacturer's label, and was in the original package. The process for determining their value was as follows: 10 grams of the extract was treated with an equal weight of water, and subjected to a gentle heat until the extract was reduced to a syrupy consistence. 90 c.c. of alcohol was then added, digested and strained, and the residue treated, 3 times successively, in a similar manner. To the mixed liquids 4 grams of lime was added, previously hydrated and in powder, and the flask frequently shaken during twelve hours. The lime decomposes the salt of atropia, and removes the organic acid and coloring matter by subsequent filtration. The filter was washed with alcohol; diluted sulphuric acid was then added to the filtrate, until the liquid acquired an acid reaction, and the precipitate of sulphate of calcium and coloring matter removed by filtration, and the filter washed. The alcohol was then removed by evaporation, in divided portions, at a gentle heat, water added to the mixed liquids and thrown on a wetted filter, and sufficient water added to the filter to make the solution of sulphate of atropia measure 100 c.c. The atropia having been separated from much of the coloring matter, the quantitative results were obtained by Mayer's process, namely, a volumetric solution of iodohydrargyrate of potassium, or rather of corrosive

sublimate, in excess of iodide of potassium, the strength of which solution was 13.546 grams of corrosive sublimate, and 49.8 grams of iodide of potassium, per litre. Of this solution 1 c.c. will precipitate .0145 of a gram of atropia. Experiments were first made with a known quantity of pure atropia, dissolved in water and dilute sulphuric acid, in order to become acquainted with the process and to insure correctness with the solution prepared. In each case not less than three titrations were made.

TABLE OF RESULTS.

MANUFACTURER.	Test solution requisite for 100 c.c. of extract solution.	Indicating atropia.	Percentage of atropia in extract.
Extr. Belladonnæ Alcoh. U. S. P.	17·732	·2571	2·571
Lazell, Marsh & Gardiner,	17·33	·2511	2·511
Parke, Davis & Co.	16·264	·2358	2·358
Burrough Bros.	16·264	·2358	2·358
Henry Thayer & Co.	12·666	·1836	1·836
Tilden & Co.	12·4	·1798	1·798
Chas. Ellis' Son & Co.	12·133	·1759	1·759
McKesson & Robbins,	11·71	·1697	1·697
E. Merck (alcoholic extract),	10·26	·1488	1·488
Geo. Allen & Co.	9·73	·1411	1·411
Herrings & Co.	8·133	·1179	1·179
Mt. Lebanon, N. Y. (inspissated juice, 6 years old),	6·24	·0904	·904
E. Merck (aqueous extract), made 1869,	1·9	·0275	·275

These results lead to the following conclusions :

1st. That the American extracts of belladonna contain a larger percentage of atropia than the imported, the reason for which, doubtless, is the mode of manufacture; while the former are generally made from the imported leaves, by the use of alcohol and subsequent evaporation, the latter are made from the expressed juice.

2d. That the extracts which stood lowest in the list of assays were aqueous extracts. The two lowest containing but .9 and .27 of one per cent. of atropia, and since the date of manufacture of both was 1869, it tends to show the instability of such preparations. There can be no doubt but that, at a recent date of manufacture, aqueous extracts of belladonna, and, perhaps, of hyoscyamus and conium, are of better quality, but if, in a few years, they deteriorate to worthless extracts, is there not good ground for saying that the class of inspissated juices of narcotic plants are unstable, unreliable, unsafe and not worthy a place in the U. S. Pharmacopœia? I say unsafe, for, if a

worthless article is used by a physician, and he does not perceive the desired effect, he will increase the dose until obtained, and consequently give much larger doses than if he were dealing with an extract of good quality; but when he obtains the extract of good quality, the continuation of the same large doses might prove fatal.

In closing this paper, I would suggest a similar examination of the extracts of hyoscyamus and conium, as this is a subject of interest and importance to the medical and pharmaceutical profession.

DOES VERATRUM VIRIDE CONTAIN AN ALKALOID OTHER THAN JERVIA?

BY CHARLES BULLOCK, PHILADELPHIA.

While engaged on the experiments with jervia, published in Vol. 47, page 449, of this Journal, my attention was directed to the circumstance that the portion of the alkaloid taken up by ether (veratroidia), when dissolved in acetic acid gave a copious precipitate on addition of a solution of nitrate of potassium. This reaction appeared to indicate that the greater part of this product was jervia, which, under some favoring conditions, had dissolved in the ether.

With a view of investigating the subject, as also to look more carefully for *veratria*, if any existed in the drug, the old method of obtaining the alkaloid as described in my paper, Vol. 37, page 321, was retraversed, with some modifications which afforded better results in the amount of product obtained.

The fluid extract of *veratrum viride* was poured into water, acidulated with acetic acid (free from sulphuric and hydrochloric acids), the resin separated by filtration, and the clear liquid concentrated by evaporation until all the alcohol was expelled. Precipitation was then effected by caustic soda (in place of carbonate of soda).

The resin was dried, powdered and digested in warm water acidulated with acetic acid, and the filtered solution precipitated by soda. Finding the resin still contained some alkaloid, it was treated with a warm solution of caustic soda, which dissolved the resin readily, leaving a sediment, which was thrown on a filter and washed until the washings were without color. This precipitate was dissolved in dilute acetic acid and reprecipitated by caustic soda. From the resin representing one pound of the root *eight grains* of impure alkaloid were

obtained. The whole of these impure products were mixed together, dried, redissolved in acetic acid and precipitated by caustic soda. After washing and pressing between folds of bibulous paper, it was dissolved in alcohol, digested with animal charcoal, filtered, and evaporated to dryness. A semi-crystalline mass was obtained, weighing thirty grains (from one pound of root).

The alkaloid was powdered and digested with *washed* ether. The ethereal solution left on evaporation a light-colored resinous coating adhering to the upper surface of the capsule, with a crystalline deposit at the bottom.

This product weighed eight grains, and represents the supposed "*Veratroidia*" existing in the drug, and should also contain veratria, if any was present. An examination of its character was made as follows:

Treated with warm dilute acetic acid, it afforded a turbid solution, with finely divided insoluble matter held in suspension. After filtration, it was precipitated by caustic soda, and the precipitate washed in a filter with a warm solution of soda. The alkaline washings (A) were reserved, and the alkaloid washed with water to remove the alkali, pressed and dried.¹

Character of the Precipitate.—When dry, it had a light yellow color. A portion dissolved in acetic acid (the acid being in excess) gave with a solution of nitrate of potassium an abundant precipitate characteristic of jervia. This precipitate dissolved on heating the solution, and crystallized out on cooling.

Heated on platinum foil, it charred and left a residue when incinerated to whiteness; the grey ash dissolved without effervescence in dilute nitric acid; this solution was divided into two portions. To one was added ammonia and oxalate of ammonia; the usual reaction of *lime* was obtained. To the other acid portion a solution of molybdate of ammonia was added; after standing two hours, a deposit of phosphomolybdic acid was obtained.

The alkaline washings (A), after neutralization with hydrochloric acid, were evaporated to dryness, the product powdered and exhausted with ether. The ether left, on evaporation, a small amount of resinous matter, which gave the following color reactions:

¹ An after examination of the soda by alcohol used, showed it to contain traces of alumina and magnesia.

With hydrochloric acid, a light pink color in the cold ; on heating, the color passed to a brownish-yellow.

With sulphuric acid, a turbid yellow color, soon changing to a mahogany color, passing eventually to brown.

Heated on platinum foil, it burned with a smoky flame, and left no residue.

At this stage of proceeding the question arose, Can veratria be recognized by *color tests* in the presence of an excess of jervia? To determine the question, ten parts of commercial veratria were intimately mixed with one part of crystallized jervia. The color reactions were as follows :

With concentrated sulphuric acid, gives a yellow color, changing to a reddish-brown, surrounded by a margin of green.

With hydrochloric acid, in the cold, a faint pink seen on the upper margin ; on heating, a brownish-yellow color. The purple-red color of veratria does not appear, neither does the greenish hue given by jervia alone.

The reactions of veratria were so masked by the jervia that *no correct judgment* could be expressed that veratria was present.

Veratria is soluble in ether ; according to Fresenius, less soluble than in alcohol, when the veratria is pure.¹ Jervia, when pure, is almost insoluble in ether, but in the presence of the associated resin it dissolves to a limited extent ; hence a separation of the two alkaloids by ether cannot be effected so long as resin is present. The jervia must first be removed ; to effect this object, I took advantage of the insolubility of nitrate of jervia in a solution of nitrate of potassium. One part of pure jervia in 1000 parts of water (acetic solution) is precipitated almost immediately on addition of a solution of nitrate of potassium in excess ; complete precipitation is not effected if any resin is present. The precipitate is not soluble in excess of acetic acid ; it dissolves on heating the solution, and crystallizes out on cooling.

Veratria, when dissolved in acetic acid, one part in sixty, the solution containing excess of acid, is not disturbed by addition of a solution of nitrate of potassium. If a large excess of the potassium solution is added, it causes a slight cloudiness, which does not disappear on the application of heat. After standing twenty-four hours, no precipitation of the alkaloid takes place.

¹ See Fresenius "Qualitative Analysis," American edition, 1865, page 404.

A portion of the "veratroidia" was then digested in a solution of caustic soda to remove as much resin as possible; after washing, it was dissolved in dilute acetic acid, precipitated by soda, washed, again dissolved in acetic acid, and a solution of nitrate of potassium added (causing an immediate precipitate). After standing twelve hours, the solution was filtered to free it from nitrate of jervia; addition of caustic soda now produced but a small amount of precipitate, this had a light yellow color and reacted as follows:

With sulphuric acid, an evanescent purple, changing immediately to brown, then passing to a mahogany red.

With hydrochloric acid, in the cold, an immediate purple-pink; on heating, the color becomes greenish-yellow.¹

The remainder of the product was then dissolved in acetic acid, addition of nitrate of potassium again afforded the jervia reaction.

The color reactions, as shown, are of little value in determining the presence of veratria mixed with jervia; the continued precipitation caused by nitrate of potassium, as the resin is more perfectly removed, points to the conclusion that jervia and resin make up the product called "veratroidia."

EXPERIMENT SECOND.—Having ascertained that muriate of jervia, as also muriate of veratria, were soluble in a menstruum composed of alcohol, one part, and water, two parts, acidulated with hydrochloric acid, the following method of obtaining the products from the drug was tried:

PART FIRST.

Take of Powdered veratrum viride root,	.	.	5 pounds
Clean sand,	.	.	10 "
Alcohol, 95 per cent.,	.	.	10 pints
Water,	.	.	20 "
Hydrochloric acid,	.	.	7½ fluidounces

The powdered root mixed with the sand was moistened with the menstruum. After standing twenty-four hours it was transferred to a glass percolator and displaced with the remainder of the menstruum. Displacement was then continued with water until thirty pints of percolate was obtained. The alcohol was distilled off and the watery solution evaporated to five pints. To this a solution of caustic soda was added to decided alkaline reaction, to dissolve the resin and pre-

¹ Pure veratria gives no color when dissolved in hydrochloric acid in the cold.

cipitate the alkaloids, and the whole thrown upon a filter of strong paper. After draining off the dark liquor, the contents of the filter were washed until the filtrate was almost without color. The solid matter in the filter was then partially dried and digested in a warm solution of acetic acid. After filtration the acetic solution was precipitated by soda, washed, pressed between folds of bibulous paper, and digested in hot alcohol, with addition of a little animal charcoal. The alcoholic solution was evaporated until precipitation commenced. On cooling it formed an almost solid crystalline mass. When dry, this product weighed eighty grains.

It was dissolved in dilute acetic acid, and an equal volume of cold saturated solution of nitrate of potassium added, causing an abundant precipitate. After separating the nitrate of jervia, the mother-water was precipitated by soda, the precipitate washed, dried and digested in washed ether. The ethereal solution yielded a residue on evaporation weighing about *two grains*. An examination of this product proved it to be jervia mixed with resin.

PART SECOND.

After draining the liquid from the drug in the precolator displacement was continued with strong alcohol, until the root was exhausted; two pints of water were added to the precolate, and the alcohol removed by distillation. The resinous residue left on evaporation was treated with a warm solution of caustic soda until the resin was dissolved, then diluted with water and set aside to settle. After decanting the dark supernatant liquor, the precipitate was thrown upon a filter, washed, treated with a solution of warm acetic acid, and the acetic solution precipitated by soda. After washing and pressing between folds of paper, the precipitate was dissolved in hot alcohol and digested with animal charcoal; the alcoholic solution, on evaporation and cooling, deposited the alkaloid in fleecy prismatic crystals, having a rosy tinge of color. Washing in a filter, when nearly dry, with ether, removed the coloring matter and left the product almost colorless. The amount of alkaloid obtained was $42\frac{1}{2}$ grs.; this added to the 80 grs. obtained by the first process with hydrochloric acid and dilute alcohol, gives $122\frac{1}{2}$ grs. crystallized jervia as the yield from five pounds of root.

The examination for veratria was conducted as follows:

After most of the jervia had crystallized out from the alcoholic solution, and resinous and coloring matter commenced depositing, the solu-

tion was evaporated to dryness, the product dissolved in warm dilute acetic acid, and precipitated by a solution of nitrate of potassium. After standing 24 hours to allow the nitrate of jervia to crystallize out, the solution was filtered and precipitated by caustic soda, and the precipitate washed with a warm solution of the alkali, which removed considerable coloring matter. It was then redissolved in acetic acid, the jervia again separated by nitrate of potassium, and the mother-water precipitated by soda. This operation was performed the third time, after which nitrate of potassium no longer caused a precipitate. When heated on platinum foil the product burned with a smoky flame and left a residue; in dilute hydrochloric acid, it dissolved without effervescence. Addition of ammonia (containing so little carbonate as not to disturb a solution of acetate of lime) afforded an immediate precipitate; after separation of the precipitate, oxalate of ammonia afforded the usual reaction for lime. The product was therefore lime-salts, resin and some alkaloid. To separate these, the product was dissolved in alcohol, filtered and evaporated to dryness; this was treated with ether until exhausted, and the ether allowed to evaporate spontaneously. The residuum insoluble in the ether was fixed when tried in the flame. The ether left, on evaporation, a central portion of white crystalline product, with the upper margin surrounded by a non-crystalline, light-colored resinous-looking matter. An examination of both of these products separately gave no indication of the presence of veratria. The whole of this ether product was then treated with dilute acetic acid; a turbid solution was obtained, with finely-divided insoluble matter suspended (resin). After filtration, addition of a few drops of a solution of nitrate of potassium gave an immediate precipitate of nitrate of jervia.

THE RESIN, which was dissolved by the solution of caustic soda, was precipitated by dilute sulphuric acid, well washed, dried, powdered, and treated with rectified petroleum benzin; the benzin solution left on evaporation a light-colored, fatty matter, which solidified on cooling.

The resin was then treated with washed ether until exhausted; on evaporation, the ether left a dark red translucent resin. (This resin was entirely insoluble in warm dilute acetic acid, but when triturated with precipitated carbonate of lime, a portion afterwards dissolved with the lime in acetic acid, and was precipitated with the lime on addition of caustic soda, containing a little carbonate; excess of soda did not

remove *all* the resin from the precipitated carbonate of lime. After drying the precipitate, it yielded the resin to ether. This experiment demonstrates the manner in which this resin follows the alkaloid containing earthy salts in dissolving in acids, and precipitating with it on addition of alkalies.)

The resin was dissolved in alcohol and digested with animal charcoal, until most of the color was removed. The alcohol left, on evaporation, a soft resin. This resin reacts with strong sulphuric acid in a manner well calculated to *suggest* the presence of veratria,—giving a brownish-red color passing to a cherry-red, and finally to a mahogany color. After standing some hours the solution loses its color and carbonized particles separate.

To hydrochloric acid in the cold, this resin imparts a light pink color.

The resin was treated with warm acetic acid, and found to contain no alkaloid.

As the result of these experiments we find jervia to be the only alkaloid in the root of *veratrum viride*. The so-called veratroidia is a mixture of jervia with a light-colored resin; the larger the amount of this resin present, the greater will be the proportion of jervia taken up by ether. In the first experiment we had eight grains dissolving in ether out of thirty; in the second, where the resin was more completely removed by caustic soda, eighty grains yielded but two grains to ether.

The reaction of the alkaloid with sulphuric acid, hitherto considered to indicate the presence of veratria, is due to a resin which is taken up by ether, and which adheres with great persistence to the alkaloid, dissolving and precipitating with it.

The interesting question arises, to what are we to attribute the marked difference in the physiological effects shown by experiments made with jervia and “veratroidia?” It must be attributed to the resin—either *per se* or as modifying the effects of jervia. The subject is worthy of further investigation.

To obtain jervia entirely white, the nitrate is decomposed by digesting it with a solution of caustic soda, washing, redissolving in acetic acid, precipitating by soda, dissolving in hot alcohol, evaporating and crystallizing. It crystallizes in white prismatic crystals resembling sulphate of morphia. These crystals fuse at 380° to 385° F., and are insoluble in ether. From acetic solution caustic alkalies, including

ammonia, precipitate jervia completely;—the precipitate is insoluble in an excess of these precipitants.¹

ASARUM CANADENSE AS AN INDIGENOUS AROMATIC.

BY ALBERT H. VAN GORDER, PH.G.

(*Extract from an Inaugural Essay.*)

This officinal drug, which has been placed in the secondary list of our "Pharmacopœia," is known under the popular names of wild ginger, Indian ginger, colt's foot root and Canada snake root, and is used instead of ginger by the country people in some parts of New England. On account of its medicinal properties, it has been noticed by all our writers on native medicines; but further than occupying a place in our *Materia Medica*, it seems to be very little used in regular practice.

That the rhizome possesses properties adapting it to be classed with the aromatic stimulants, is shown by its constituents, as given by Bigelow, Rushton and Procter. According to Rushton, it contains gum, starch, resin, fatty matter, chlorophyl, volatile oil, salts of lime, potassa and iron, to which may be added lignin. Of the volatile oil he says: "It is of a light greenish-yellow color, having a warm, slightly bitterish aromatic taste, and contains all the virtues of the plant."

Wm. Procter, Jr., has extended our knowledge concerning the volatile oil, and medicinal properties of the root. He says: "The essential oil seems the most energetic element; the root possessing neither emetic nor cathartic properties, but is an aromatic stimulant with diaphoretic powers. It contains neither *asarite* or *asarum camphor*, nor substances analogous to them." It is thus seen to possess none of the emetic or cathartic properties of its congener, the *Asarum Europæum*, which would render it unfit for use as an aromatic.

It would seem strange that, possessing, as this root does, such pleasant and strongly aromatic properties, its use should be so limited. Doubtless, this neglect is, in a great measure, owing to the want of

¹After completing these examinations, my friend, George J. Scattergood, kindly placed in my hands his original notes, with samples of the products obtained by him from *Veratrum viride* in 1862. The products marked "*veratria*," I found to be *jervia* mixed with the peculiar resin which gives a mahogany red color with sulphuric acid. They correspond with the product called "*veratroidia*," an examination of which was one of the objects of the present investigation.

suitable pharmaceutical preparations which might be offered to the physician. If the aromatic properties of this drug, which is easily obtainable, can be exhibited in such a way as to be substituted for the more costly ones now used in so many of our official preparations, there can be no reason why it should not be done, for it would certainly afford these preparations at a much less cost to the pharmacist.

Joseph L. Lemberger ("Proceedings Am. Pharm. Asso.," vol. xvii, page 382) recommends the substitution of asarum and calamus for the cardamom in extract. colocynth. comp., and says, "We can easily dispose of cardamom, and substitute some of our indigenous aromatics."

With a view of making some pharmaceutical preparations of asarum which might serve the physician as a vehicle or adjuvant, the writer has made several experiments, the results of which he submits to examination. Before attempting the preparations, however, experiments were made, in order to become better acquainted with the constituents furnishing the aromatic properties of the root.

Eight ounces of the dried root was ground, and macerated with five pints of water for twenty-four hours; introduced into a copper still, and two pints distilled over. This distillate was of a milky appearance, having a layer of volatile oil on top. The volatile oil being separated, the water was saturated with sodium chloride and redistilled as long as the second distillate came over odorous—amounting to one and a-half pints. The second distillate was slightly milky, having small oil globules on the surface. The oil being separated by means of a pipette, the water was again treated with sodium chloride, and distilled. This time twelve ounces were obtained, having odor and taste of volatile oil. The small portion of oil floating on this distillate was separated, and the water, for the third time, saturated with sodium chloride and distilled. After four ounces were recovered, the water passed over odorless and tasteless. The oil floating on this fourth distillate was in such minute quantity as to be with difficulty separated. The volatile oil thus obtained amounted to 2 per cent. of the root employed, and corresponded to the description given of it by Rushton and Procter.

The mother-liquor left in the still after each operation, consisting of a saturated solution of sodium chloride, was found to still contain organic matter. Four portions were agitated with ether, chloroform, gasolin and bisulphide of carbon, respectively, each separated, and

evaporated spontaneously, leaving, in each case, a slight residue. Ether appearing to be the best solvent, the whole of the mother-liquor was agitated with it, the supernatant liquid separated, evaporated spontaneously, residue dissolved in alcohol, and again evaporated. A soft resinous product was thus obtained, neutral to test-paper, having a strong, agreeable odor, entirely different from the volatile oil, and peculiar to itself. It possessed a warm, pungent taste, quite lasting. The amount of this principle obtained was too small to institute any further experiments. It would seem from this, however, that we are not to look upon the essential oil as the only volatile constituent representing the aromatic properties of the root; for this new volatile principle, although in very small quantity, exhibited its characteristics in a very distinct manner, thereby being easily distinguished from the volatile oil.

In addition to these volatile principles, *asarum* also contains considerable amount of a resin which is by no means inactive. In preparing a fluid extract and tincture, alcohol was used as menstruum, for the purpose of obtaining all this resin. Using ether as menstruum, an oleo-resin was first prepared.

Eight troyounces of the dried root, sufficiently fine to pass through a No. 40 sieve, was precolated with stronger ether, until the precolate passed through colorless. The greater portion of ether was recovered by distillation, the remainder evaporated spontaneously, leaving an oleo-resin of a liquid consistence, amounting to 10 per cent., by weight, of the root employed, and possessing all the properties of the drug.

A fluid extract was made according to directions given by Parrish, in his second-class of fluid extracts.

Several tinctures were prepared, using different proportions of alcohol and water; but alcohol (sp. gr. '835) seemed to afford the best menstruum. The strength of the tincture made was four ounces to the pint.

From the fluid extract two syrups were made, one possessing the virtues of the resin, as well as the volatile oil, while the other was deprived of the resin by trituration with magnesium carbonate. A marked difference was to be observed in the taste as well as appearance of these two syrups. The one freed from resin was, of course, much the handsomer, being transparent and of a dark amber color, while the one containing the resin, although of a lighter color, was hardly transparent. The first syrup would be the best for use where

only a flavoring ingredient is wanted; but where something is needed to disguise the taste of a medicine prescribed, the syrup containing the resin would answer an excellent purpose, as it has a very strong taste, precisely like that of the root, and at the same time so pleasant as to be agreeable to the taste of almost every one.

The preparation of the above syrups may be comprised in the following formulæ:

Syrup of Asarum (first process).

Fl. ext. of asarum,	f℥i
White sugar,	℥xv
Water,	f℥viii

Triturate one-half the sugar with the fluid extract, and heat moderately to evaporate the alcohol. Add the remainder of the sugar, then the water; raise to boiling point, and strain.

This gives rather more than a pint of syrup of a light color, and with only a slight turbidity.

Syrup of Asarum (second process.)

Fl. ext. of asarum,	f℥i
Magnesium carbonate,	grs. cxx
White sugar,	℥xv
Water,	f℥viii

Rub the fluid extract with the carbonate of magnesium and a small quantity of sugar, and then with the water, gradually added, and filter. To the filtered liquid add the remainder of the sugar, dissolve with the aid of a gentle heat, and strain.

NOTE ON SYRUP OF FERROUS IODIDE.

BY J. F. JUDGE.

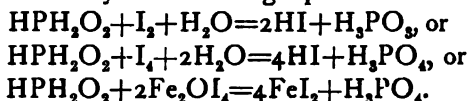
(Read before the Cincinnati College of Pharmacy.)

When proper care is taken in the preparation of Syrup of Ferrous Iodide, a product is obtained of a pale green tint, which, if kept in full and well stopped bottles, does not change color; but it occasionally happens that from some defect or other in the process, the syrup does not retain its pale green, but assumes a brownish hue.

Some years since, hyposulphite of sodium was proposed as an agent capable of restoring the syrup, when discolored, to its normal tint. In producing this change, sodium hyposulphite, by its affinity for oxygen, passes into sodium sulphate, and in so doing parts with one-half of the sulphur it contains, thus: $\text{Na}_2\text{S}_2\text{O}_3 + \text{H}_2\text{O} + \text{I}_2 = \text{Na}_2\text{SO}_4 + 2\text{HI} + \text{S}$.

The sulphur precipitates in minute division and remains suspended in the syrup, rendering it turbid and nearly as unsightly as before the treatment with the hyposulphite.

About two years ago, I had some syrup of ferrous iodide which had changed color, and desiring to restore it to its original greenish tint, I did not feel disposed to use hyposulphite of sodium, because of the precipitate of sulphur already mentioned. In thinking upon the matter, I concluded that hypophosphorous acid, having like affinity for oxygen, would perform a similar work to that effected by the hyposulphite. I, therefore, added to a sample of my colored syrup a few drops of hypophosphorous acid (P. & W.'s), shook the bottle, and allowed it to stand a short time, and examined it, when it was found to have resumed the proper color, and the syrup was perfectly clear; I then treated the whole of the discolored syrup with hypophosphorous acid with like satisfactory results. The chemistry of these reactions will be readily understood by the following equations:



There are on the table two small bottles of syrup of ferrous iodide taken from one lot; to one has been added a few drops of hypophosphorous acid, and its color is normal, the other is exhibited for comparison, showing the change of color.

If, after making syrup of ferrous iodide, it is observed that it has a slight olive tint in place of the pure pale green; this may be removed by the addition of a small quantity of solution of hypophosphorous acid, and upon introducing some clean, small nails or wire, and allowing it to stand awhile, small bubbles of gas (hydrogen) will be observed accumulating on the surface of the nails, and if the bottle is moved these will pass up through the syrup; the nails react with the hydriodic acid (formed as explained in the foregoing equations), with the liberation of hydrogen and production of ferrous iodide. Syrup thus treated is not prone to become discolored soon again.

It is not my intention to propose that hypophosphorous acid be introduced as a regular constituent of syrup of ferrous iodide, for I am opposed to tampering with officinal formulas; but I do suggest it as a remedy for the difficulty, when syrup of the iodide of iron changes color.

THE PILL SUBJECT.

BY JOSEPH P. REMINGTON.

The article, by the writer, on the "Ready-made Pills of our day," which was published in the recent Proceedings of the American Pharmaceutical Association, seems to have caused a disturbance in the ranks of the pill fraternity, more particularly, however, to some interested in the high-pressure lenticulars, who no doubt, find it up-hill work to force them upon the market, and who grow restive under criticism.

The results, as published in the paper above mentioned, having been the subject of so much misconstruction, it has been deemed best to reproduce the principal portions of the paper, in order that a clearer understanding may be had concerning it.

After the preface, the following occurs:

"Realizing the fact that a fair absolute test of solubility that would be applicable to all the varied conditions of the fluids of the stomach, whether acid, alkaline, or neutral, would be an impossibility, it was thought best to take temperature, acidity, alkalinity, and digestive power into consideration, and from this range a tolerably fair judgment might be arrived at.

"Taking, then, fair samples of the best pills that the market afforded the following experiments were made: (See page 160.)

"An examination of the results as tabulated shows that *the plain uncoated pill is to be preferred in point of solubility*; that next in order the sugar-coated pill comes; then the compressed, and lastly the gelatin-coated.

"It was thought advisable to try, along with the comparative tests, the Cachet de Pain under the same circumstances, and it will be seen that this method of coating powders and pills is superior to any in point of permitting the medicine to dissolve or digest readily."

A careful examination of these remarks in connection with the table of Relative Solubilities, which is reprinted just as it occurs in the "Proceedings," will convince most of the readers of the "Journal" who take sufficient interest in the subject, that the conclusions arrived at *were* correctly deduced from the results of the experiment; and it is the intention to pursue the inquiry further, and report at a future time.

A recent review of the article by a friend and neighbor (page 121, March number, "Am. Jour. Pharmacy") contains some inaccuracies, which may be usefully corrected.

Table of relative SOLUBILITIES OF DIFFERENT KINDS OF READY-MADE PILLS in the market, etc., and including *Cachet de Pain*.

PIL. QUININÆ SULPH., TWO GRAINS.

Varieties.	In one fluidounce of water at 80°, Shaken every 3 minutes.	In one fluidounce of water at 98°, shaken every 3 minutes.	In one fluidounce of water slightly acidified, shaken every 3 minutes.	In one fluidounce of water at 98°, acidulated, and containing a trace of pepsin ; shaken.
Plain, uncoated pill, (ex-cipient glycerin).	Completely disintegrated in 1 hour.	Completely disintegrated in 10 minutes.	Completely disintegrated in 3 minutes.	Completely dissolved in 10 minutes.
Sugar-coated pill.	Tastes bitter in 15 minutes ; disintegrated in 3 hours.	Tastes bitter in 8 minutes ; in 6 hours deep ridges appeared on surface.	Sugar off in 5 minutes ; disintegrated in 25 minutes.	Bitter in 3 minutes ; dissolved in half an hour.
Compressed or lenticular.	But slightly affected in 30 minutes ; in 1 hour not one-fourth dissolved.	Hardly affected ; not dissolved in 3 hours.	Sharp edges gone in 10 minutes ; in 40 minutes dissolved.	Dissolved in half an hour.
Gelatin-coated.	Coating swelled partially in 1 hour ; quinine not all dissolved in 18 hours.	Gelatin affected in 20 minutes ; pill retains its shape for 24 hours.	Not affected in 5 minutes, nor in 30 minutes ; slightly bitter in 57 minutes ; gelatin swelled up in 6 hours.	Bitter in 20 minutes ; disintegrated in 1 hour.
Quinine enclosed in a wa-fer or cachet de pain.	Quinine completely shaken out in a few moments.	Quinine completely shaken out in a few moments.	Quinine completely shaken out in a few moments.	Quinine completely shaken out in a few moments.

PIL. CATHARTIC. COMP., U. S. P.

Varieties.	In one fluidounce of water at 80°, shaken every 3 minutes.	In one fluidounce of water at 98°, shaken every 3 minutes.	In one fluidounce of water at 98°, with 10 drops diluted sulphuric acid, shaken every 3 minutes.	In one fluid ounce of water at 98° with 10 drops liq. potasse, shaken every 3 minutes.
Plain, uncoated pill (ex-cipient glycerin).	Disintegrated in 1 hour.	Disintegrated in one hour.	Not disintegrated in one hour and a half.	Gone in 15 minutes.
Sugar-coated pill.	Disintegrated in one hour and a half.	Disintegrated in one hour and a half.	Water colored in 10 minutes ; nearly disintegrated in 1 hour.	Disintegrated in half hour.
Compressed or lenticular.	Disintegrated in two hours.	Disintegrated in one hour and a half.	Slightly colored ; not disintegrated in 1 hour.	Disintegrated in quarter of an hour.
Gelatin-coated.	Swelled enormously, but intact for 12 hours.	Gelatin swollen, but water not colored in 2 hours.	Swollen up in 2 hours ; water not colored.	Not disintegrated in two hours.
Quinine enclosed in a wa-fer or cachet de pain.	Powder shaken out in a few moments.	Powder shaken out in a few moments.	Powder shaken out in a few moments.	Powder shaken out in a few moments.

This critic complains, firstly, that a pill made with glycerin as an excipient, is not a fair criterion of the uncoated ready-made pill of our day. In reply to this the writer would say that he has taken the trouble to inquire of a number of pharmacists as to the excipient used by them for pills which they expect to keep for a greater or lesser length of time, and he finds that the majority use glycerin, either by itself or in combination, and the reason is obvious—to keep the pill in a soft or friable condition, so as to secure ready disintegration, and the belief that this method of making a pill, represented the best kind of ready-made pill of our day, has been further confirmed.

He states, secondly, "*that he should have given the preference to the compressed pills, as it appears in his tables that they were the only ones dissolved; all the others were only disintegrated.*"

This statement in point of fact is not correct, as a glance at my table will show, the word *dissolved* having been used *twice*, not in relation to compressed pills, but in the last column of the Pil. Quiniæ Sulph. table the word will be seen twice, connected with the plain and sugar-coated pill.

The reason the word was used at all, in alluding to the compressed quinia pill, is simply because this form of quinia pill could not possibly, under the circumstances, be forced to disintegrate. *It is a hard mass*, and it is its habit to dissolve slowly from the outside, the pill growing smaller and smaller until it finally disappears, whilst the plain and sugar-coated pills usually disintegrated quickly.

The disintegration of the pill must soon be followed by solution or digestion, if the stomach contains any fluids (as most stomachs do), and the mass of which the pill is composed is capable of being acted upon.

The next complaint is, "*In the case of the uncoated compound cathartic pill, Mr. Remington uses the indefinite and impractical expression of Gone in fifteen minutes. This implies a perfect solution of the pill, and when we take the ingredients into consideration, we know that they cannot be wholly dissolved in a weak alkaline solution.*"

My friend has been led astray again. Here, the expression "Gone in 15 minutes" expresses the fact exactly. The pill, as a pill, was gone. My table has it, Plain uncoated pill, gone in 15 minutes. It had disappeared. There is no warrant whatever for his statement that "*a perfect solution of the pill was implied,*" and the only object of using this admittedly odd expression was to *avoid* the incorrect one of dissolved.

But let us look for a moment at my friend's table, on page 124 of the March number (before quoted). It is headed, Comparative table, showing the time required for *dissolving*¹ the different makes of pills, as enumerated, *in water, at 100°¹ Fahrenheit*, and in a solution corresponding to the gastric juice, at 100° Fahrenheit.

Under it, by casting the eye down the first column, we see, not only the compound cathartic pill *dissolved in plain warm water*, without the use of even weak alkali, but rhubarb, compound rhubarb, and, worse than either, aloes and mastiche; and this error is repeated in many places, in these and in other cases throughout his table.

How was the *solution* of the rhubarb, mastiche, calomel, etc., etc., in plain water accomplished?

A curious error *in this connection* occurs again in my critic's table, on page 124. The second pill on the list is called Pil. Quinæ bisulph., 2 gr., and it is under the column *officinal*. (?) The time taken to dissolve this pill is set down as 45 minutes, in water, temp. 100°.

He himself defines a regular officinal ready-made pill of the shop as one usually made in strict accordance with the ingredients and excipients directed in the United States "Pharmacopœia." See page 121 (12th line in article).

Now, in what edition of our national authority does he find *this pill* officinal? and how could *he* use officinal ingredients and excipients for it, when such a pill does *not* exist in our "Pharmacopœia"?

The next attempted criticism is in relation to the shaking every three minutes in the case of the gelatin coated pill. It will be observed that the time referred to here (18 hours) is in the first case connected with a distinct sentence, for it says, Quinine not all dissolved in 18 hours, and in the second case, Pill retains its shape for 24 hours.

It may be said, also, that as this was a comparative test, as soon as the position of the pill was determined in the race the point was settled, and although the time occupied in making the experiments did extend far into the night, the terms 18 and 24 hours do not fully express the *full* time that it did take to disintegrate the pills in their respective liquids, the actual time being much longer, but are added as explanatory notes.

The next point as to how temperature can be maintained is not worthy of consideration, and was not stated in the paper because the writer believed that *every member* of the American Pharmaceutical Association knew how to manage such a simple thing as this.

¹ Italics, mine.

My critic's next subject of attack—the object of the representation of the cut of the pill machine for making the third-rate pill—is best answered by quoting from the original paper *the statement*, which is (referring to the compressed pill), that

“The powerful pressure, often brought to bear to cause the dry materials to cohere, often operates unfavorably in this variety of pill, except in a few instances where the ingredient is readily soluble, as bisulphate quinia, bromide or iodide of potassium, etc., etc.

“It may not be known that this variety can be made readily by the pharmacist himself, if he so desires, by having a mechanic make a simple piece of apparatus.

“Take a solid cylinder of iron,” etc., etc.,

and then follows a description of how to make a pill-press.

How my friend can construe the above, so as to cause him to make the statement, “That Mr. Remington really intended to endorse the compressed pills as superior to all other ready-made pills of our day,” is a mystery.

My friend objects to the opinion advanced that the pressure used in making a compressed-pill interferes with its solubility, and puts forward a microscopical examination to prove his position, and he finds that under the microscope they are *quite porous*. What does “quite porous” mean, were the pores measured by a micrometer? Did he try the plain, sugar-coated or gelatin-coated pill, under the same power, for relative porosity, and, if so, why were the results not given. The fact is that pores are very plainly visible (*without* the use of the microscope), when either the plain, sugar-coated or gelatin-coated pills are broken open, as any one may prove easily.

The last point which my neighbor finds fault with is the simple process of shaking, employed by the writer.

It was not pretended that the pills were subjected to exactly this method of treatment when in the stomach, but it was believed that if “fair samples of the *best* pills that the market afforded” were placed in various liquids, and all agitated in a similar manner, that a tolerably fair *comparative* test would be afforded. Yet, how inconsistent is my friend. He objects to agitation, and yet attaches four bottles, loaded with quinia pills and water, to the eccentric rod of an upright steam-engine, speeded up to 350 revolutions a minute, and of course it ends in bringing out his favorite so-called patent pill ahead of all others; but does he not entirely stultify his results by his next few sentences, when he says “the digestive process of the stomach is not agitation, but more properly a churning or circulatory displacement process, quiet but continuous in its mode of operation”? Would it not follow most naturally that if these were his conscientious views on the subject of digestive or peristaltic action, that, instead of the eccentric rod of an upright steam-engine, speeded up to 350 revolutions a minute, the proper apparatus would have been an old-fashioned *churn* revolving once, say, in 350 minutes, quiet and continuous in its mode of operation, or — a circulatory displacer?

CACHETS DE PAIN.

BY ANDREW BLAIR, PH.G.

I have read the article in the March "Journal" headed "Cachets de Pain," by H. P. Lechler, Ph.G., and extend my sympathy to him in his unfortunate experience with the article. He has described correctly the manner of preparing these wafers, but his manipulations have not been successful; still he should not on this account condemn the whole arrangement, when hundreds of others will testify to their success in preparing them and the great satisfaction given both to physicians and patients by the use of them. I desire to add a word on the subject which my friend "hopes will be referred to as a thing of the past." I do not intend or wish to argue that these wafers will be or ever were intended as a substitute on "all" occasions for the usual pills or powders; but there are cases, not unfrequent, where the physician wishes to give a nauseous or bitter dose, the taste of which he would like to disguise. In such cases these wafers answer the purpose admirably. I will refer to the different points mentioned by Mr. Lechler, who I feel has not been correctly informed as to the proper way of preparing and giving directions for taking these wafers, hoping it may enable those who have had like experience with him to dispense the article with more satisfaction to themselves and their customers.

Mr. Lechler declares that it takes at least five times as long to prepare twelve cachets as to prepare the same number of powders or pills. Our experience has been very different. We have prepared thousands of them since they were first introduced, and the time required has been very little if any more than for folding the same number of powders. The complaint that the discs adhere to the press, indicates that the dies are not clean, or have become wet by the excess of moisture spoken of by Mr. Lechler. All kinds of apparatus and machinery, ever so complete and perfect in their different parts, require more or less skill and judgment on the part of the operator. Sealing corks with a metal stamp and sealing-wax is a very simple operation, and makes a beautiful, smooth impression, when properly done; but by continued use the stamp gets warm, and the wax begins to stick to it; now, if the operator persists in trying to make a good impression, he will fail every time till he cleans and cools the stamp. So, also, in using the wafer machine. Careful drying after they are removed from the press is not necessary if properly prepared. I have seen quinine

wafers prepared by the hundred and thrown into a large bottle immediately as they were taken from the press, without adhering to each other in any instance. There is no occasion at any time to have an excess of moisture on the rim of the wafers if the proper appliances are used. There is to be had what is called a "Cachet Machine," which has among its several parts a "Wetter," suited to each of the three sizes of wafers ; also, a "Wetting Pad," by the use of which just the proper quantity of moisture is applied, and in just the proper place around the rim of the wafer. If my friend has used a brush to accomplish this (as I have known some to do), I can easily account for the excess of moisture he speaks of.

The tendency to cause a rupture, as referred to, is very rare, if "a little" care is used in handling them, and it is taken into consideration that a slight pressure of the hand on the press is all that is needed to secure the edges of the discs to each other. In regard to the directions for the patient—"to simply dip the wafer in water, then with the fingers put it on the tongue, and swallow with a draught of water," is not correct, and will occasion many failures in attaining the object for which they are intended. The mere dipping in water is not sufficient to make them soft and pliable ; and if they are held long enough to accomplish this, they become so glutinous that the least pressure of the finger would cause a rupture.

The proper directions are : Place a wafer in a spoonful of water, let remain a few seconds, till soft, then swallow altogether. "If necessary," it might be well to add "the patient need not swallow the spoon." In regard to the physicians not giving the proper directions for taking them, this can, and should be remedied by every intelligent apothecary, namely, have the above directions printed on a small label, and placed on the box, in addition to the usual *Rx* label. Given according to these directions, Cachets become soft and pliable, accommodate themselves to the shape of the throat and afford no discomfort or inconvenience to the patient. A child can take the large size without trouble.

Any one, physician or patient, seeing a new thing, for the first time, without any explanation, in many cases will be perfectly ignorant of its use or mode of operation, and, for want of a proper explanation, it may fall into disrepute. This, no doubt, has often been the case with Cachets.

I heard an intelligent physician, when shown these wafers the first time, remark, "Why, you don't expect any one to swallow those big buttons, those rough edges would scratch a man's throat," but when it was explained how they were used, and he had actually swallowed one, he changed his tune and left the store with the remark, "They are excellent for the purpose they are intended."

The claim of the inventor of Cachets, that, by their use, two separate salts can be introduced into the stomach, and there form another salt, is verily true. The combinations made use of by Mr. Lechler have enabled him to show (in these instances only), the absurdity of the claim. I do not know if any of his friends in the medical profession are in the habit of directing a Seidlitz powder to be taken thus, the white powder to be taken first, and the blue one immediately after, in order to have the tartrate of soda in a nascent state in the stomach. I do not recollect any instance where a physician has desired to prescribe mixtures that would produce such evolution of carbonic acid in the stomach as those mentioned by Mr. Lechler, and, therefore, do not consider it a fair test. There are many instances where the claim can, and has been, successfully brought into use.

I have written these lines solely with a desire to show the friends in pharmacy that there are some good qualities in these wafers, and that they answer an excellent purpose in many cases.

PRACTICAL NOTES.

BY GUSTAVE C. RACHER.

Medicated Waters.—As medicated waters are very apt to spoil, I conceived, two years ago, the idea of substituting glycerin for magnesia. I was successful with the experiment so far, and therefore lay it before the profession for consideration. The formula is the following:

Volatile oil,	3ss
Glycerin (pure),	3ii
Mix by succussion, add	
Distilled water,	3ii

Mix and transfer to a filter, adding through it the requisite quantity of water.

Adulteration of Balsam of Peru.—A simple test, by which even a small addition of castor oil to the balsam may be detected, is the following:

Put ten drops of suspected balsam in a mortar, and rub it quickly with half a fluidrachm of sulphuric acid for one minute ; add then half a fluidounce of water, keeping rubbing briskly for two minutes longer. Take the resulting black mass out, put it on a piece of filtering-paper, in order to detach the adhering diluted sulphuric acid. When the balsam is pure, it will give a quickly-hardening black, after an hour, brittle mass ; but when the balsam is mixed with castor oil, the resulting mass will stay tenacious, stick to the fingers, and resemble soft, black pitch.

Carrollton, La., February, 1876.

THE DIVISION OF POISONS.

BY WALTER E. BIBBY, PH. G.

(Read at the Pharmaceutical Meeting, March 21st.)

As a large number of the medicines prescribed by physicians of the present day are very poisonous, it devolves upon the pharmacist to exercise the greatest care and caution in compounding prescriptions containing such poisonous substances as strychnia, hydrarg. chlor. cor., arsenious acid, narcotic extracts, etc. It often occurs that physicians prescribe these remedies in minute doses for children, aged persons and delicate females ; it is, therefore, exceedingly important that they should not receive a fraction over the quantity prescribed.

The greatest care and attention should be given to this class of prescriptions, so that, when a third is prescribed, a half grain may not be given, which, in all probability, would result very seriously, or produce a condition of affairs entirely different from that anticipated by the physician ; moreover, the uncertainty attending the weighing of fractions of grains by ordinary scales, renders it necessary for the pharmacist to first weigh one grain and then divide this into the quantity prescribed, in other words, virtually guess at the quantity.

To remedy this, and at the same time, secure to physicians and pharmacists absolute certainty, I would recommend that trituration of the poisons in common use be made of such a strength that each grain of the trituration shall represent a certain quantity of the poison, and the trituration be made only with sugar of milk. The reasons for using this substance are various. In the first place, sugar of milk is a harmless, hard, gritty, odorless and almost tasteless substance. It is

less liable to attract moisture from the atmosphere than any other substance; in fact, it possesses all the qualities desired for making a perfect trituration. The proportion I would suggest are one grain of the poisonous substance to seven grains of sugar of milk, making in all, eight grains,—the whole to be thoroughly triturated. The process of trituration is too well known to pharmacists to require elucidation in this article, and they are also well aware how important it is to carry out this process in an exact and careful manner.

Now, when a physician writes for a quarter of a grain of arsenious acid, all that is necessary is to weigh two grains of the trituration, and you have the quarter of a grain desired. This method I hold to be the safest in weighing poisons—a method by which very small fractions of grains may be obtained,—and where children, the aged or very delicate are interested, to be one of precision. The physician can also prescribe with a feeling of certainty when using those poisonous substances in this trituration, and he may have the assurance that, when he prescribes the one quarter of a grain, he obtains that amount,—for the reason, that two grains of any substance will turn the beam of an ordinary scale more readily than a quarter of a grain. I have seen scales in some of our first-class stores on which the half of a grain could not be weighed with any degree of certainty, but on which two or four grains could be weighed with accuracy.

Likewise, the pharmacist can be more expeditious in dispensing his order, thereby rendering the sick a prompt, safe and reliable prescription, and one exactly in accordance with the physician's wants.

REMARKS ON IRON SALTS IN THE FORM OF SCALES.

BY G. H. CHAS. KLIE.

These preparations are all obtained by spreading the thick, syrupy liquid of the several salts on glass or marble, and letting it dry in the open air, or, which is preferable on account of being more expeditious, in a drying chamber. They are handsome and elegant in appearance, and their successful preparation gives great satisfaction to the preparer. In the following, I desire to give some of my observations regarding these preparations, noted down while making them.

The "U. S. Pharmacopœia" gives formulæ for the preparation of seven. They are: *Ferri citras*, *ferri et ammonii citras*, *ferri et am-*

monii tartras, ferri et potassii tartras, ferri et quiniæ citras, ferri et strychniæ citras and ferri pyrophosphas. There are others, obtained in the same form as these, but not officinal. I propose to confine my remarks to the above-mentioned, exclusively.

Except pyrophosphate of iron, they all have oxide of iron for base. This is made from the solution of tersulphate of iron, by precipitating with water of ammonia. To obtain a perfect oxide of iron free from discoloration, a solution of tersulphate of iron is used, in which all sulphate of iron is perfectly oxidized. In preparing the solution, this is ascertained by taking a small quantity, diluting with water, and adding water of ammonia in excess. If a clear, reddish-brown precipitate results, oxidation is complete, but, if it is discolored, brownish-black, with dirty gray, nitric acid is added to the hot solution, drop by drop, until the disengagement of nitrous acid gas ceases, when the oxidation will be found to be complete, and the precipitate obtained without discoloration. The precipitated oxide of iron is washed until the washings pass nearly tasteless, or if wanted perfectly pure, first wash with water, and finally with distilled water, until the washings cease to produce a precipitate with chloride of barium.

The magma of oxide of iron is dissolved in citric acid at a temperature not exceeding 140° F., and evaporated at the same temperature, to form citrate of iron. This salt dissolves with difficulty in cold, but more readily in warm water.

Ammonio-citrate of iron is prepared by adding a sufficient quantity of water of ammonia to neutralize the acid solution of citrate of iron. This neutralization renders an otherwise difficultly soluble salt readily soluble in cold water.

In tartrate of iron and ammonium, oxide of iron is dissolved in a neutralized solution of bitartrate of ammonium. The "Pharmacopœia" says, "slowly soluble," which is so, it being rather slowly soluble.

Tartrate of iron and potassium is made by dissolving oxide of iron in the free tartaric acid of bitartrate of potassium or cream of tartar. The "Pharmacopœia" says, "wholly soluble in water." I find it, prepared strictly according to the formula, slowly soluble in cold water, the solution depositing a copious precipitate.

Citrate of iron and quinia is prepared by dissolving a certain quantity of quinia in solution of citrate of iron. The "Pharmacopœia" says of the salt, "slowly soluble in cold water," which is in truth so; in fact, it is too slowly soluble.

In citrate of iron and strychnia, strychnia is dissolved in a solution of citrate of iron and ammonium. The dry salt is readily soluble in cold water.

For pyrophosphate of iron, instead of water of ammonia a solution of pyrophosphate of soda is used as precipitant. The precipitated pyrophosphate of iron is thoroughly washed, for if any considerable quantity of sulphate of sodium should remain, it will, when the salt is dried, effloresce and destroy its characteristic appearance. The magma of pyrophosphate of iron is dissolved in a neutral solution of citrate of ammonium. Although the "*Pharmacopœia*" says, "it is wholly and freely soluble in water," I find it, in reality, very slowly soluble in cold water.

I have often made these several preparations, and those that dissolve readily in cold water always gave entire satisfaction; but the tartrate of iron and ammonium, tartrate of iron and potassium, citrate of iron and quinia and pyrophosphate of iron, although made strictly according to the formulæ of the "*Pharmacopœia*," and were unexceptional in appearance, still their solubility, when compared with that of the same preparations purchased from the wholesale manufacturing chemist, was invariably found inferior. This proved very discouraging, and for a long time I could not find out how to remedy the defect. All the certainty I gained was, that the wholesale manufacturing chemist had a method of making these preparations readily soluble in cold water, of which the "*Pharmacopœia*" mentioned nothing. All at once the thought occurred to me: If citrate of iron, so difficult of solution in cold water, is, by the addition of water of ammonium, rendered readily soluble, why should not the other salts, having the same defect, be rendered just as soluble by the same addition? I followed up the idea, and found it entirely successful. The water of ammonia is invariably added after final filtration, before evaporating to a syrupy consistence. Care must be taken, however, not to add too much, especially to citrate of iron and quinia. If too much is added to this preparation the quinia will be precipitated, although it may be redissolved by the gradual addition of small quantities of citric acid. If the solutions of the different salts are tested before evaporation, before making the addition of water of ammonia, they will be found to react decidedly acid, and it seems this free acid occasions the difficult solubility of the dry salt.

If the quantities in the formula for tartrate of iron and potassium of

the "Pharmacopœia" are taken as given, it will require about 3 fl. ozs. of water of ammonia for neutralization of the free acid, and rendering the salt soluble, the product weighing about 8 ozs. avoi. It requires about the same quantity for the others, but litmus paper is the surest and best test.

N. St. Louis, Mo., March 19th, 1876.

THE INVERSE SYNTHESIS OF THE SO-CALLED TASTELESS IRON COMPOUNDS.

BY R. ROTHER.

The theory that a ferric salt, as, for instance, the chloride, should directly combine, upon the principle of salification, with a normal monad salt of a polybasic vegetable acid, conflicts with all chemical laws, and neither the old dualistic hypothesis or the new typical theory can embrace or comprehend it. It is equally a failure on the plan of the compound salts, since double, triple and quadruple salts, properly so called, are respectively derived from dibasic, tribasic and tetrabasic acids when each unit of equivalency is separately saturated by a distinct basilous radical. It is likewise inadmissible of classification with another category of compound salts, the reverse of the preceding, which the writer denominates secondary, tertiary and quaternary, according to the atomicity of the basic radical, whose independent units of equivalency are separately saturated by corresponding acid radicals.

By the laws of chemical affinity, ferric chloride in aqueous contact with normal potassium citrate, can no longer exist as such, because the ferric molecule, feebly replacing the basic hydrogen of the chlorhydric acid, finds itself superseded by a more perfect base, whose affinity is greater for the stronger chlorous than citric radical. Therefore potassium chloride and ferric citrate must result. A mixture of ferric chloride and tripotassic citrate in certain proportions becomes green, and it was found that twice the equivalent amount of monad citrate was required to produce that result. Nothing was, however, mentioned of the intermediate change, and the belief was permitted to prevail that the final green is the only color that appears. The writer has, however, noticed that the pale yellow ferric chloride solution assumes, in contact with the citrate, a preliminary red, which, by continued addition of the citrate, gradually and completely changes into green. Owing to the rather strong character of the citric radical and its tendency

to form double salts, the latter property is exerted before entire double decomposition is effected; hence, in order to insure this completely, sufficient monad citrate must be present to form double salt with the ferric citrate to be produced. This is very clearly seen from the following equation:



On evaporating the solution containing the mixture represented by the second member of this equation, a greenish-white granular mass is obtained. Since potassium chloride is not sufficiently soluble in alcohol to effect a separation, the writer proposed to eliminate it by means of dialysis. A capacious parchment filter, containing the concentrated solution, was suspended in pure water, and after a few moments a strong exosmotic current of heavy liquid was seen descending from the apex of the cone. After about six hours, the powerful endosmotic current had nearly filled the dialyser which at first was scarcely one-third full. The diffusate had assumed a yellowish tint, showing that a trace of iron had also passed; but on concentration the potassium chloride began to crystallize abundantly, and on evaporation to dryness a crystalline residue of potassium chloride was obtained, corresponding to over $\frac{3}{4}$ of the theoretical yield. Having found the parchment filter too inconvenient, the writer again concentrated the liquid in the dialyser, placed it into a capacious wide-mouthed bottle, then tied over the mouth with pig's bladder previously washed in very dilute ammonia, and inverted the bottle into a vessel containing pure water. The dialysis now proceeded more satisfactorily, since the endosmotic current was nearly overcome by the tension of the atmosphere within the bottle. A slight increase of the volume of the diffusum was, however, noticed, and the consequent compression of the enclosed air distended the membrane considerably.

The dialysis was discontinued after about 48 hours, having in the mean time changed the diffusate frequently. The colloidal remnant of the diffusum was then tested for chlorine with argentic nitrate, after strong acidulation with nitric acid, when only an opalescence appeared, showing that complete removal of the potassium chloride had taken place, whilst the green color of the residual liquid remained unchanged.

The iodide was then subjected to dialysis. As the writer had already separated the potassium iodide by means of alcohol, a trial with dialysis seemed really superfluous; but, as it had been intimated that free

iodine made its appearance in the diffusate, the writer undertook the experiment. The compound was prepared, but it was observed that, owing to the carbonaceous character of the iron filings, a small quantity of iodine had been converted into iodhydric acid, which caused effervescence long after the iodine color had disappeared. By now adding the remaining third of the iodine, a liquid resulted which, by reason of part of its iodine being united to hydrogen, instead of iron yielded a mixture of ferrous iodide, free iodine and iodhydric acid, containing less iron than is required to form Fe_2I_6 , by an amount equivalent to the iodhydric acid that was formed. On now treating this solution with potassium nitrate, that part of the iodine only was converted into potassium iodide which corresponded to Fe_2I_6 , the rest remaining free. Hence, if such a solution is dialysed, free iodine must necessarily appear in the diffusate. Before dialysing this liquid the writer concentrated it by evaporation, and thus got rid of the free iodine. The solution, on being treated like that of the chloride, yielded, after a dialysis of four hours, a diffusate faintly yellow from a trace of iron, but containing no free iodine. This liquid, on evaporation, gave a white crystalline residue of potassium iodide, representing nearly $\frac{1}{4}$ of the iodine originally used. The second diffusate rendered up the remaining complement.

The officinal ferric pyrophosphate was next tried, but, although a yellowish diffusate appeared, no decided amount of residue was obtained; accordingly it must be inferred that no crystalloid is present, and therefore dialysis cannot effect a separation.

The ammonio-citro-ferric orthophosphate was then prepared ("Pharmacist," August, 1871), and a concentrated solution precipitated by alcohol. The filtrate contained a trace of iron, and on evaporation yielded quite an appreciable syrupy residue, which, on the addition of ammonia in excess, congealed to a crystalline mass of triammonic phosphate. Dialysis of another portion of the concentrated solution gave a yellow diffusate, from which a small amount of saline residue was obtained. This result also points to a colloidal condition of the mixed compounds.

The writer in his paper on Ferric Iodide ("Laboratory," February, 1876) proposed to show that the officinal ferric pyrophosphate could be more conveniently and economically prepared by mixing certain proportions of ferric citrate and ammonium pyrophosphate. On the

same plan, it was also proposed to construct the orthophosphate by mixing ferric citrate with triammonic phosphate. Trial showed that mixtures of these two kinds resulted in products having the appearance of the preparations made by the usual methods. It was, however, ascertained that the precise imitation by inverse synthesis, was impossible, since, in each of these two cases, by the usual methods, an excess of the ferric phosphates was absorbed.

By an inspection of the officinal formula for ferric pyrophosphate, it was discovered that ferric pyrophosphate and triammonic citrate react upon each other in the proportion of one equivalent of ferric pyrophosphate to three equivalents of triammonic citrate, producing ammonio-ferric pyrophosphate, ammonio-ferric citrate and free ferric citrate, thus : $2(\text{Fe}_4\text{P}_2\text{O}_7) + 6(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7 = \text{Fe}_4\text{P}_2\text{O}_7 \cdot 3(\text{NH}_4)_4\text{P}_2\text{O}_7 + 2(\text{FeC}_6\text{H}_5\text{O}_7 \cdot (\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7) + 2(\text{FeC}_6\text{H}_5\text{O}_7)$

This shows that the officinal salt is a rather complex compound, and that the presence of uncombined ferric citrate is the cause of the peculiar tint described as apple green. It also explains why dialysis can not separate the mixture, as all three of the constituents are uncrystallizable, and, therefore, colloidal. The nearest approach to this compound, by means of inverse synthesis, is four equivalents of ferric citrate and three of ammonium pyrophosphate, which produces only ammonio-ferric pyrophosphate and ammonio-ferric citrate, thus : $8(\text{FeC}_6\text{H}_5\text{O}_7) + 6((\text{NH}_4)_4\text{P}_2\text{O}_7) = \text{Fe}_4\text{P}_2\text{O}_7 \cdot 3((\text{NH}_4)_4\text{P}_2\text{O}_7) + 4(\text{FeC}_6\text{H}_5\text{O}_7 \cdot (\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7)$

This is also equal to $2(\text{Fe}_4\text{P}_2\text{O}_7) + 8((\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7)$, that is one equivalent of ferric pyrophosphate and four equivalents of triammonic citrate, and differs from the officinal by one equivalent of triammonic citrate in excess.

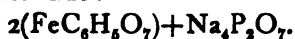
Otherwise, the difference in the two compounds may also be shown as follows : $4(\text{Fe}_4\text{P}_2\text{O}_7) + 12((\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7) = \text{Fe}_4\text{P}_2\text{O}_7 + 3(4(\text{FeC}_6\text{H}_5\text{O}_7) + 3((\text{NH}_4)_4\text{P}_2\text{O}_7))$

This indicates that the officinal salt is equal to one equivalent of ferric pyrophosphate and three of the imitation salt.

The salt, or rather mixture produced by retrograde decomposition, has the bright green color peculiar to ammonio-ferric citrate, but addition of a certain proportion of ferric citrate generates the apple green tint. By mixing two equivalents of ferric citrate and one of ammonium pyrophosphate a mixture exactly analogous to the officinal salt is

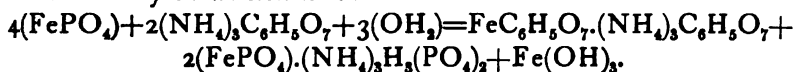
obtained, containing a like quantity of ammonio-ferric pyrophosphate mixed with twice as much ammonio-ferric citrate and free ferric citrate as the officinal salt contains.

The writer thinks that in the next revision of the Pharmacopœia the now officinal ammonio-pyrophosphate should be dropped and replaced by a sodium salt represented by two equivalents of ferric citrate and one of sodium pyrophosphate thus :

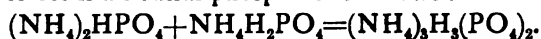


Inverse synthesis can not exactly produce the ammonio-citroferic orthophosphate as no mixture of ferric citrate and triammonic phosphate can approach any nearer than equal equivalents of each. The writer, however, believes that also in this case a sodium compound is better. Ferric citrate and disodic phosphate will produce perfectly green compounds in proportions that do not exceed 4 equivalents of the former to one of the latter.

Ferric orthophosphate reacts upon triammonic citrate in the proportion of two equivalents of the first and one of the second, producing a solution which is brown-red by transmitted and green by reflected light. Addition of citric acid, monammonic or diammonic citrate to this solution discharges the red color mostly, and forms a solution which is also green by transmitted light. By evaporating the red solution to a syrupy consistence and spreading it on plates of glass or porcelain beautiful brownish green scales are easily obtained. Similar treatment of the acidulated solution as readily yields greenish scales which cannot be distinguished by appearance from the officinal pyrophosphate. The reddish brown color of this compound points to a basic condition due to the presence of free ferric hydrate, hence its formation may be written thus :



This result assumes the generation of an ammonio-ferric orthophosphate in which one equivalent each monammonic and diammonic phosphate unite to form a neutral phosphate as follows :



In such a mixture the writer attempted to dissolve freshly precipitated ferric orthophosphate, but failed, no solution taking place. However a trial with ferric citrate succeeded perfectly, and a new salt of a brown-green color was obtained. Equal equivalents of ferric citrate

and ferric phosphate unite to produce a soluble compound, the solution of which, when evaporated and scaled, yields a beautiful secondary salt, having the formula: $\text{Fe}_2(\text{C}_6\text{H}_5\text{O}_7)(\text{PO}_4)$.

This ferric citrophosphate is undoubtedly superior in various respects to the complex mixtures obtained from the ferric phosphates by the use of monad citrates. This salt is entirely ferruginous, and must therefore rank medicinally with the normal or primary ferric salts in which only one acid radical is combined. Its formation is also remarkable, in that it cannot be produced by treating ferric phosphate with citric acid, no combination taking place. If however ferric citrate is treated with a certain proportion of orthophosphoric acid a green liquid results, but if an excess of phosphoric acid is added all the iron is precipitated as ferric phosphate, which the liberated citric acid fails to retain in solution.

A convenient method of preparing ferric citrophosphate will be to treat a concentrated solution of ferric sulphate with an amount of disodic orthophosphate sufficient to convert half the iron into phosphate and then adding disodic carbonate in excess, washing the mixed phosphate and oxy-carbonate by decantation and dissolving it in an amount of citric acid sufficient to convert the ferric oxy-carbonate into ferric citrate.

Ferric chloride, sulphate, iodide, etc., remain unchanged in presence of ferric citrate, for the reason, that radicals of the same basicity can only form compound salts of this order; hence, only ferric salts of tribasic acids can directly unite with ferric citrate.

As a general rule all the amorphous ferric salts, or mixtures of them with other amorphous salts, can be obtained in transparent scales, but a mixture of an amorphous ferric salt with some other crystallizable salt, will invariably produce an opaque granular mass iususceptible of crystallizing or scaling. Therefore, if the result of a reaction between a ferric and some other salt, yields on drying, a granular mass; a crystalline constituent can positively be inferred, but if such a decomposition results in a transparent, scaly compound, the absence of crystalline bodies is unfailingly pointed out.

All the green compound ferric citrates when treated with alkalis in excess, become brown or red, and all such compounds which have been either reddened by alkalis or obtain this color as the result of the reaction which produced them, will become green after the addition of

citric acid or an acid monad citrate. Mixtures of ferric chloride, sulphate, iodide, citrate, etc., with sufficient monad citrate acquire a uniform green color. The officinal ferric pyrophosphate has a green color of a different shade, due to an excess of ferric citrate; addition of triammonic citrate changes it to the green of the other mixtures. Ammonio-citroferric orthophosphate is green only by reflected light and red (derived from the presence of free ferric hydrate,) by transmitted; addition of either di- or monammonic citrate causes a change to the green of the other mixtures.

If ferrous salts have a marked affinity for nitrogen dioxide, much more have the ferric salts for nitrogen trioxide and tetroxide. Ferric salts retain these gases so firmly that prolonged boiling of their solutions fails to expel them, and even the dried compounds must be maintained at a comparatively high temperature for a considerable time before complete separation is effected. In consideration of this fact the use of potassium chlorate in place of nitric acid is greatly preferable. Furthermore, the writer has ascertained the important fact ("Pharmacist," October, 1872,) that there is a chemical difference between ferric salts produced by nitric acid, and those generated by means of potassium chlorate.

From the chemical and physical differences of the ammonio-ferric sulphates, obtained from the two modifications of ferric sulphate, the writer infers that through the action of nitric acid, probably aided by heat, the constitution of the ferric molecule itself is altered. For this reason the writer proposes to designate the normal condition of molecule as orthoferric, and that in the modified state as metaferric. All the orthoferric salts are distinguished by their lighter colors. Ammonio-orthoferric sulphate is beautifully yellow and of greater stability than the ammonio-metaferric sulphate, which has a violet color. Formerly, tincture of ferric chloride was prepared from a ferric hydrate, obtained by exposing ferrous carbonate to the air until the conversion was effected. The reputation of tincture of ferric chloride was built upon this preparation, which had not sustained the action of nitric acid or heat. Neither did this tincture possess the ethereal odor which characterizes the new officinal tincture, in which the presence of nitrogen oxides generates ethyl nitrite, upon which this odor depends. Tincture of ferric chloride, recently prepared and treated with potassium citrate so as to form the so-called tasteless tincture, will also

acquire the ethereal odor, for the reason that the nitrogen oxides are unaffected by this addition, and perfectly free to react upon the alcohol.

Tincture of ferric chloride, prepared with potassium chlorate, does not attain the ethereal fragrance, and if ethyl chloride, also called hydrochloric ether, is generated, its by no means pleasant odor would certainly become perceptible. This tincture, however, has a pure, spirituous odor, and is otherwise analogous to the older tincture which represented an orthoferric salt.

MINUTES OF THE PHARMACEUTICAL MEETING.

The fifth regular meeting of the session was held March 21st, 1876, Dillwyn Parrish in the chair. The minutes of the previous meeting were read and approved.

Prof. Maisch donated to the cabinet a cone from the *Pinus pinea*, of Southern Europe, being the same species which yields the pine-nuts exhibited at a former meeting.

Henry Trimble exhibited an unknown substance, which had been sent from Maryland to this city, to be sold for powdered ergot. It has no resemblance to that drug.

Prof. Remington read a paper on a singular reaction occurring in a medicine composed of syrups of wild-cherry and squill, spirit of nitre, tincture of lobelia and sulphate of morphia, which turned green on standing, as was stated in a letter received from J. W. Hall, of Nashville, Tenn. The color reaction did not take place immediately, but after some hours, and appears to be due to the presence of traces of iron in spirit of nitre and acetic acid, from which the syrup of squill had been made. The conclusion arrived at by the experimenter was, that extreme nicety should be observed in the apparatus for handling such liquids. Prof. Remington proposes to continue his experiments, and report at the next meeting.

Dr. Pile had frequently observed cases in which a variation in the order of mixing the ingredients would determine different colored solutions.

J. T. Shinn had been surprised to find, upon attempting to prepare a prescription containing sulphate of iron, sulphate of magnesium and chloride of sodium, a precipitation of a red iron compound would take place, and nothing but the addition of sulphuric acid would prevent it.

Dr. Pile had recently seen a prescription for Pulvis Membranæ Galli; the opinion was held that it was a mystification symbolic of pepsin.

J. C. Biddle submitted samples of powdered squill, the usual caking of which is prevented by the use of sugar of milk in the proportion of 1 part to 3 of the squill. The first sample had been prepared 18 months ago, and had received such care only as is customary with a dispensing bottle. The other had been exposed to the air on a paper for one month, without having lost its pulverulent condition. The use of sugar of milk for this purpose had been suggested to him by W. F. Bender, Apothecary to the Philadelphia Hospital.

W. H. Mattern exhibited a suppository mould made of plaster-of-paris and suppositories made in it, and stated that it worked satisfactorily. The mould was made in a manner similar to that proposed on page 5 of "Am. Journ. Pharm. 1873."

Dr. Miller read a paper, by Walter E. Bibby, entitled, "The Division of Poisons." (See page 167.)

Prof. Maisch approved of the suggestion, and said the method is recognized in the Pharmacopœia Germanica, for preparing powdered narcotic extracts, and in stores where much dispensing is done, it is customary to keep many poisonous articles, triturated to a uniform powder with milksugar, and many salts in solution of a definite strength.

J. T. Shinn desired to know the experience of the members in preserving solutions for hypodermic use. Prof. Remington had tried many of the methods that had been recommended, but still met with difficulties, and, as these solutions are, from the nature of circumstances, at times, liable to cause irritation, had abandoned the idea of keeping a stock ready made. Prof. Maisch called attention to the remarks of Prof. C Johnson, of Baltimore, in "Am. Journ. Pharm.," 1873, p. 200, suggesting the use of sulphurous acid.

Compressed pills being spoken of, Prof. Remington said the paper prepared by him, and read before the American Pharmaceutical Association, at Boston, was made public two weeks before Mr. Dunton had procured his patent, and that his second paper was published before that gentleman procured his second patent. J. T. Shinn reminded the members that compressed pills were no new thing, he having seen some made more than 20 years ago.

Prof. Maisch desired to have, if possible, our meetings continued over the coming summer.

The thanks of the meeting were voted to the donors and exhibitors. On motion, adjourned to meet on April 18th, 1876, at 3½ P. M.

WILLIAM MCINTYRE, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

PHILADELPHIA COLLEGE OF PHARMACY.—On Monday, February 28th, the fifty-fifth course of lectures was closed, and the examinations commenced on the following day, lasting until Friday, March 4th, one set of the following questions being given to the candidates on each day, the written answers being required within five hours :

QUESTIONS IN CHEMISTRY.

1. What is Chlorine? Give a method by which it may be obtained, state its properties and mention the officinal articles of the U. S. and Br. Pharmacopœias, in forming of which gaseous Chlorine is used.
2. What compounds of Lead are officinal? State the mode of preparation of each and give a formula (in symbols) of the reaction of any one of them.
3. What are the present chemical and officinal names of the Carbonates of Sodium? Give and explain the methods by which they are produced, and state the characteristic properties of each and tests of their purity.

4. What are the official names (U. S. and Br. P.) of Muriatic Acid? Give and explain the method by which it is produced, the forms in which it is used in medicine and pharmacy and any impurities found in the acid of commerce.
5. What compounds of Silver are official? Give their mode of preparation, their properties and adulterations.
6. What Tartrates are official? Give the mode of preparation common to nearly all, and any special cautions and reasons therefor required in some.
7. How is Corrosive Sublimate prepared? Explain the process, give its composition, properties and official names.
8. By what tests may the salts of Magnesium, Zinc and Cadmium be distinguished from each other?
9. What are the Antidotes for the Mineral Acids, and how do they act?
10. Under what circumstances is Water liable to become contaminated with Lead? State what salts, often present in river water, will prevent this contamination.

QUESTIONS IN MATERIA MEDICA AND BOTANY.

1. Describe briefly the development of the Axis of Plants, and how its growth differs from that of the leaves.
2. Give the name, natural order and habitat of the plant yielding the official Rhatany Root. What are the physical characteristics, chemical constituents and medicinal properties of the drug, and how may it be distinguished from the roots of other species of the same genus?
3. Name the plants, with their natural order, yielding the European and the American Veratrum; describe the growth, structure and dose of the official portion, and state in what respects the two drugs differ from each other in their physical and chemical properties.
4. Give a brief description of the most important characteristics of the official varieties of Cinchona; name the plants from which they are obtained, and the alkaloids predominating in each variety.
5. Give the name, natural order and habitat of the Aconite Plant; describe the official parts, give their doses and name the characteristic alkaloids and acid found in them. From what common acid may the latter be obtained by the influence of heat?
6. What are Cloves? Give the name, natural order and habitat of the plant yielding the drug, its structural characteristics, and approximately the percentage of its most important constituents.
7. Hops. Give the name, natural order and part of the plant used; describe the drug, and state to which portion and which constituents the medical properties are mainly due.
8. Give the name, natural order and habitat of the plant yielding Colchicum Seed, and the time of their collection. Describe them, and give their medicinal properties and dose, and the characteristic tests for their alkaloid.
9. What are Turpentine, and what causes the opaque sediment in some varieties? State how the different kinds are procured and how the official resins of Coniferae are prepared.
10. Give the characteristics of the natural order of *Lobeliaceae*, and describe the official herb of this order, giving name and habitat.

QUESTIONS ON PHARMACY.

1. Define Specific Gravity, and state its uses in Pharmacy. A bottle holds half a pint of the liquid adopted as the sp. gr. standard, it holds at the same temperature 4,557 grains of an official liquid; what is that liquid? Show the method of obtaining your answer.

2. What is the value in English weights and measures of the Gramme, Litre and Metre? Give the names and value in the metrical system of the prefixes used in multiplying and dividing the Gramme.
3. Define the process of Percolation. State the reason why certain kinds of drugs are required to be finely powdered and others coarsely powdered, naming examples of each.
4. Give three official methods of preparing Medicated Waters, illustrating each with an example from the "Pharmacopœia."
5. What is an Emulsion? Give the ingredients in Mistura Asafoetidæ, Mistura Chloroformi and Mistura Ferri Comp. State what chemical reaction takes place in the latter preparation.
6. Give the ingredients in the following official preparations: Compound Infusion of Gentian, Aromatic Syrup of Rhubarb, Compound Tincture of Benzoin, Compound Powder of Rhubarb, Wine of Opium.
7. Why are the following substances used in their respective preparations? Carbonate of Magnesium in Syrupus Zingiberis; Boiling Hot Water in Unguentum Potassii Iodidi; Compound Spirit of Lavender in Liquor Potassii Arsenitis; Nitric Acid in Liquor Ferri Chloridi; Aromatic Sulphuric Acid in Infusum Cinchonæ Rubræ.
8. Give the process for preparing Atropia, the test for it and its principal use in medicine.
9. State the proportions and doses of the official Liquid Preparations of Opium.
10. What are the best tests for recognizing Gallic Acid, Conia, Meconic Acid, Strychnia and Quinia?

QUESTIONS BY THE EXAMINING COMMITTEE.

1. Why is Aqua Ammonizæ used in the preparation of Purified Muriate of Ammonia; Muriatic Acid in Purified Animal Charcoal; Soap in Pills of Aloes; and Sulphate of Potassium in Dover's Powder? Give the reason why Blistering Cerate is kept in the liquid state for half an hour.
2. From what plant are Belladonna Leaves and Root obtained? and what alkaloid do they contain? Give an outline of the formula for the production of all the official preparations, with the exception of the alkaloid, and the doses of those used internally.
3. Describe Mercury as found in the shops; state four of the different preparations it enters into in the metallic state; and specify the ingredients contained in each.
4. Give the locality, natural order and official name of the plant yielding Copaiba. State how it is obtained and what are its two principal constituents. Name its two official preparations.
5. State what doses of the following may be administered, and name the antidotes for poisonous doses of the same: Extract of Opium, Nitrate of Silver, Lupulin, Sulphate of Sodium, Sulphate of Iron, Acetate of Lead.
6. State the proper methods of detecting adulterations of Oil of Wintergreen with Alcohol, Chloroform with Alcohol, Oil of Lemon with Castor Oil, Yellow Wax with Paraffin, and Iodide of Potassium with Bromide of Potassium.
7. State the composition and correct official title of the following: Brown Mixture, Seidlitz Powders, Compound Extract of Colocynth and Compound Cathartic Pills. Write the Pharmacopœia formula for the latter in Latin, avoiding abbreviations.
8. State the formula for preparing Liquor Ferri Subsulphatis. Give its color, consistency, taste and specific gravity. Does it mix in all proportions with Water and Alcohol without decomposition? What effect is produced by the addition of Aqua Ammonizæ? By what popular name is this solution known?

9. State whether the following *prescriptions* A. B. C. D. are proper to be dispensed, and if not, give the reason why?

A.

R—Strychniæ Sulphatis, gr. xxx.
Syrup. Zingiber., . . . f3i.
Aqua, . . . f3v.
Misce.
Sig. A teaspoonful thrice daily.

B.

FOR DYSENTERY.

R—Pulv. Opii.
Pulv. Ipecac.
Hydrarg. Bichlorid: . . . aa gr.iii.
Pulv. Acaciæ.
Syrup. aa q.s.
Misce et fiat massa in pil. iii dividenda.
Sig One to be taken at bed-time.

10. Translate the following :

E.

R—Quiniæ Sulphatis
Ferri Sulphatis Exsiccati aa gr.i.
Extract. Nuc. Vomica, gr. 4.
M. ft. pilula; dentur tales doses No. xx.

F.

Transpose this into Troy Weight.

Grammes.

R—Aloës Pulv.....2.
Hydrarg. Chloridi Mit. . . 0.75
Resin. Podophylli.....0.125
M. ft. pil. No. xii.

C.

R—Ammonia Muriat., . . . 3ss.
Antim. et Potass. Tart., . . . gr.i
Tinc. Opii Deod., . . . f3ii.
Mist. Glycyrrh. Comp., . . . f3viii.
Misce fiat mist.
Sig. A dessert spoonful every three hours.

D.

R—Hydrarg. Chlorid. Mit., . . . gr.v.
Pulv. Ipecac. Comp, . . . 3i.
Misce.
Sig. Take at bed-time.

G.

R—Extract. Belladonnæ, . . . gr.iii.
Tinct. Ferri Chloridi, . . . f3iv.
Syrupi, f3ss.
Mucilag. Acaciæ, . . . f3iv.
Sig. Take a teaspoonful on going to bed.

N. B.—Give your opinion of this prescription, and state what will be its condition when compounded.

H.

Write out a prescription having for a basis four fluid ounces Syrup of Tolu, containing in each teaspoonful one-eighth of a grain of Sulphate of Morphia and four minims of Tincture of Aconite Root.

The specimeus submitted for recognition, 15 minutes being allowed for each set, were as follows :

CHEMISTRY.	MATERIA MEDICA.	PHARMACY.	EXAMINING COMMITTEE.
Acid. nitromuriaticum.	Calumba.	Ergotæ pulvis	Potassii chloras.
Potassii bromidum.	Scilla.	Infus. Rosæ comp.	Sodii boras.
Potassii nitras.	Guaiaci lignum.	Acetum Scillæ.	Uva ursi.
Sodii carbonas.	Juglans.	Syrup. Pruni Virg.	Coriandrum.
Sodii hyposulphis.	Hyoscyami folia.	Ext. Taraxaci fluid.	Pulv. Jalapæ Cp.
Ammonii chloridum.	Senna, Bombay.	Liquor Calcis.	Mist. Potassii Citr.
Magnesi sulphas.	Anisum.	Spir. Ammonia arom.	Tinct. Cinchonæ comp.
Cupri sulphas.	Sinapis alba.	Ung. Zinc oxidi.	Tinct. Opii Camph.
Plumbi acetas.	Sabadilla.	Acid. tannicum.	Extr. Sennæ fluid.
Alcohol.	Kino.	Cinchonæ Sulph.	Ung. Hydrarg. oxidi rub.

The following gentlemen, having passed a successful examination, were recommended for the degree of Graduate in Pharmacy (Ph.G.). The names are in the order of merit, as ascertained from the examinations :

NAMES.	STATE.	SUBJECT OF THESIS.
1 Joseph LeRoy Webber,	Massachusetts.	<i>Assay of Atropia.</i>
2 Henry Schroeder,	Illinois.	<i>Triosteum</i>
3 John Ritter,	"	<i>Syrup of Wild Cherry Bark.</i>

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| 4 Louis Emanuel, | Pennsylvania. | <i>Glycerin as an Excipient for Pill Masses.</i> |
| 5 Albert Hapgood Van Gorder, | Ohio. | <i>Asarum Canadense as an Indigenous Aromatic.</i> |
| 6 Isaac Rouland Diller, | Illinois. | <i>Tinctura Ferri Chloridi.</i> |
| 7 James Oscar Burge, | Kentucky. | <i>The Chemical Laboratory.</i> |
| 8 William Poole, | Delaware. | <i>The Strength of Saccharated Pepsin.</i> |
| 9 John Alfred Witmer, | Pennsylvania. | <i>Tobacco.</i> |
| 10 Henry Trimble, | " | <i>Benzoic Acid as an Antiseptic.</i> |
| 11 William Duffield Robinson, | " | <i>Tinctura Cinchonæ Composita.</i> |
| 12 Joseph John Brown, | Ohio. | <i>The Alcoholic Strength of Wine.</i> |
| 13 John Chrysostom Martin, | Pennsylvania. | <i>Pharmaceutical Science.</i> |
| 14 William Peiffer Weiser, | " | <i>Eucalyptus Globulus.</i> |
| 15 Howard Buckman Sides, | " | <i>Chemical Action.</i> |
| 16 Walter Adolphus Taylor, | Georgia. | <i>Extractum Gossypii Radicis Fluidum.</i> |
| 17 Theodore Corson Wheaton, | New Jersey. | <i>Carya Porcina.</i> |
| 18 Louis Von Cotzhausen, | Wisconsin. | <i>Coumarin—its uses and sources.</i> |
| 19 William Wesley Trout, | Pennsylvania, | <i>Aque Medicatæ.</i> |
| 20 Francis Marion Murray, | Ohio. | <i>Agave Americana.</i> |
| 21 Daniel Conrad Gentsch, | " | <i>Glycerin.</i> |
| 22 Wm. Norwood Kelly Boileau, | Pennsylvania. | <i>Wax—Adulteration and Pharmaceutical uses.</i> |
| 23 Thomas Albert Huston, | Ohio. | <i>Polygonum Punctatum.</i> |
| 24 Hugh White, | Pennsylvania. | <i>Pyrethrum Roseum.</i> |
| 25 Ebenezer Miller Wells, | Mississippi. | <i>Cincho Quinine.</i> |
| 26 William Ruff, | Ohio. | <i>Iodine.</i> |
| 27 Charles Augustus Brotherline, | Pennsylvania. | <i>Phosphorus Pills.</i> |
| 28 William Henry Righter, Jr. | Delaware. | <i>Preservation of Syrup of Ipecacuanba.</i> |
| 29 George Joseph Mitsch, | Minnesota. | <i>Patent Medicines and an Analysis of Face Lotion.</i> |
| 30 Flavius Saunders Case, | Ohio. | <i>Salicylic Acid.</i> |
| 31 Hugo Franklin Baur, | Wisconsin. | <i>Mucilago Acaciæ.</i> |
| 32 Walter Theron Baker, | Pennsylvania. | <i>Medicinal Waters.</i> |
| 33 Charles William Tobey, | Ohio. | <i>Pharmacy</i> |
| 34 Emil Louis Boerner, | Iowa. | <i>Ricinus Communis.</i> |
| 35 Charles Albert Daniel, | Pennsylvania. | <i>Preparations of Calamus.</i> |
| 36 Joseph Collard Rogers, | New Jersey. | <i>Domestic Remedies.</i> |
| 37 Carl Swante Nicanor Hallberg, | Sweden. | <i>Pharmaceutical Notes.</i> |
| 38 Clarence Henderson Risk, | Pennsylvania. | <i>Dispensing Poisons.</i> |
| 39 Henry Tower Hayhurst, | Iowa. | <i>Effervescing Preparations of Sodium Tartrate.</i> |
| 40 Carl Heinrich Marquardt, | Wisconsin. | <i>Iris Versicolor.</i> |
| 41 George Blake Holden, | Massachusetts. | <i>Oleum Morrhuæ.</i> |
| 42 Philip Jacob Laver, | Ohio. | <i>Solubility of Drugs.</i> |
| 43 John Behlar, | District Columbia. | <i>Pimpinella Anisum.</i> |
| 44 Francis Abraham Roepper, | Pennsylvania. | <i>Iron and its Properties.</i> |
| 45 Charles Griffith, | " | <i>A Substitute for Volatile Lini-ment.</i> |
| 46 Charles Moenkemoeller, | West Virginia. | <i>Cinchona and its Alkaloids.</i> |
| 47 Andrew Richard Porter, | Indiana. | <i>Sium Latifolium.</i> |
| 48 Charles Williams Warrington, | New Jersey. | <i>The Privacy of the Prescription Department.</i> |
| 49 Joseph Wayne Merritt, | " | <i>Salicylic Acid.</i> |

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| 50 Benjamin Thomas Creighton, | Ohio. | <i>The Culture of Tobacco in Ohio.</i> |
| 51 Clayton Kerper Smith, | Pennsylvania. | <i>The Relation and Commercial Value of Fluid Extracts.</i> |
| 52 Charles Drum Lippincott, | " | <i>Fixed and Volatile Oils.</i> |
| 53 Harry Calvin Watt, | " | <i>Fluid Extract of Ipecacuanha.</i> |
| 54 Frank Edward Stewart, | New York. | <i>Lac Vaccinum—its Adulteration and Preparation.</i> |
| 55 Alphonso Albert Willits Bley, | Pennsylvania. | <i>Honey.</i> |
| 56 Theodric Linthicum, | Arkansas. | <i>Monobromated Camphor.</i> |
| 57 Richard Miller Sommers, | New Jersey. | <i>Menispermum Canadense.</i> |
| 58 Henry Louis Von Wittkamp, Jr. | Pennsylvania. | <i>Pharmacy.</i> |
| 59 George Washington Kram, | " | <i>Disguising Disagreeable Remedies.</i> |
| 60 Charles Eugene Hornberger, | Germany. | <i>The Discovery of Glass.</i> |
| 61 Alvin Henry Keller, | Pennsylvania. | <i>The Science of Pharmacy in the Country.</i> |
| 62 Ernest William Herrman, | " | <i>Tin Scrap.</i> |
| 63 John Dowling Groves, | Pennsylvania. | <i>On Iodine.</i> |
| 64 Philipp Henry Dilg, | Wisconsin. | <i>Euphorbia Ipecacuanha.</i> |
| 65 William Fullerton Fleming, | Canada. | <i>Cortex Liriodendron Tulipifera.</i> |
| 66 Theophilus Niblow Corby, | Pennsylvania. | <i>Proprietary Medicines.</i> |
| 67 Oliver Paschal Hooper, | Maryland. | <i>Phytolacca.</i> |
| 68 John Henry Evans, | Pennsylvania. | <i>Carbon.</i> |
| 69 Franklin Pierce Louderbough, | Delaware. | <i>Solubility and Uses of Salicylic Acid.</i> |
| 70 John William Sonnick, | New York. | <i>Syrupus Rhei Aromaticus.</i> |
| 71 Willis Brenton, | Pennsylvania. | <i>Cryolite.</i> |
| 72 Thomas Swaim Armstrong, | New Jersey. | <i>Guarana.</i> |
| 73 C. Massey Cresson Durborow, | Pennsylvania. | <i>The Deterioration of the Druggists' Stock.</i> |
| 74 George Lewis Sandt, | " | <i>Styrax Benzoin.</i> |
| 75 Robert August Koempel, | Germany. | <i>Red Wine.</i> |
| 76 Jacob Loudenslager Kolp, | Pennsylvania. | <i>Gelsemium Sempervirens.</i> |
| 77 Irvin Railey, | Kentucky. | <i>The Apothecary.</i> |
| 78 William Henry Robbins, | Pennsylvania. | <i>Turiones Asparagi.</i> |
| 79 Howard Granville Shinn, | New Jersey. | <i>Convulvulus Panduratus.</i> |
| 80 Frederick Stryker Boisnot, | " | <i>Suppositories.</i> |
| 81 Leon Joseph K. Graber, | Pennsylvania. | <i>Opium, its Uses and Abuses.</i> |
| 82 Edmund Rudolph Gatchel, | " | <i>Amylum.</i> |
| 83 Louis Philip Carbonell, | Cuba. | <i>Acidum Lacticum.</i> |
| 84 David Abraham Rosenthal, | Pennsylvania. | <i>The Wholesale and Retail Druggist.</i> |
| 85 John William Quinn, | Ohio. | <i>Opium.</i> |
| 86 Zachary Taylor Anstett, | Pennsylvania. | <i>Aristolochiaceae.</i> |
| 87 Jeremiah Dull McFerren, | " | <i>Responsibilities and Requirements of a Pharmacist.</i> |
| 88 Ezra Heiry Gingrich, | " | <i>Chemical Changes.</i> |
| 89 Albert Livingston Thorn, | New Jersey. | <i>Adulterations.</i> |
| 90 James Henry Sheridan, | Pennsylvania. | <i>Manufacture and Uses of Oxide of Zinc in Medicine.</i> |
| 91 Morrison Wright Webb, | Ohio. | <i>Patience and Care vs. Knowledge.</i> |
| 92 Winfield Scott Taylor, | New Jersey. | <i>Dispensing Pharmacy.</i> |
| 93 Daniel Albert Bowen, | " | <i>Podophyllum.</i> |
| 94 Francis Henry Poley, | Pennsylvania. | <i>Aesculus Hippocastanum.</i> |

95 Milbourn Asbury Toulson,	Maryland.	<i>Arnica Montana.</i>
96 Robert McNeil, Jr.,	Pennsylvania.	<i>Prescriptions.</i>
97 Otto Fürchtegott Koehler,	Germany.	<i>Iodinum.</i>
98 Charles Lashell,	Pennsylvania.	<i>Botany.</i>
99 Isaiah Henry Schuyler Kindig,	"	<i>Percolation.</i>
100 William Wood Stockton,	New Jersey.	<i>Trifolium Pratense.</i>
101 Charles Green Harris,	Iowa.	<i>Tinctura Ferri Chloridi.</i>
102 Wilbur Winthrop Fry,	Pennsylvania.	<i>A Thesis Dedicated to the Centennial Class.</i>
103 Allen Spengler,	"	<i>Preservation of Syrups.</i>
104 John Rufus Barr,	"	<i>Triticum Repens.</i>

Mr. Chipman Botsford, Canada (*Podophyllum peltatum*), passed the examination, entitling him to the Certificate of Proficiency in Chemistry and Materia Medica, which was granted by this College for the first time.

The Academy of Music was well filled with an appreciative audience on the evening of March 14th, to witness the Commencement ceremonies, which were enlivened by excellent music from the Germania Orchestra, George Bastert, Conductor. Many Commissioners representing foreign countries at the approaching Centennial Exposition were present upon the stage. The President of the College, Dillwyn Parrish, conferred the degree upon the above-named gentlemen, after which Professor Bridges presented the Procter prize, which had been awarded to Mr. Joseph LeRoy Webber, of Springfield, Mass. The requirements for obtaining this prize have been fixed by the Board of Trustees as follows: The candidate must have obtained the highest average in the class; the examinations in each one of the three branches and by the Examining Committee, as well as the recognition of specimens, must have been attended with such success as to merit, in each case, the predicate *very satisfactory*; in addition thereto, the candidate must have presented a satisfactory thesis. The prize consists of a gold medal and a certificate, with an appropriate inscription and a representation of the medal.

The valedictory address was delivered by Professor Remington, after which Mr. T. S. Armstrong, on behalf of the graduating class, presented to the College a complete polariscope attachment for the oxy-hydrogen lantern in use for illustrating the lectures. Vice-President Chas. Bullock received the gift on behalf of the Board of Trustees.

A large number of bouquets, books and other presents, which had been sent upon the stage, were distributed at the close of the exercises.

THE ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY held its annual meeting on Thursday, March 9th, when the following officers were elected: President, G. W. Kennedy; Vice Presidents, E. M. Boring and Samuel Campbell; Recording Secretary, Wallace Procter; Corresponding Secretary, Chas. L. Mitchell; Treasurer, Edw. C. Jones; to fill vacancies in the Executive Board, A. W. Miller, M.D., and Howard G. Jones; Trustee of the Sinking Fund, Thos. S. Wiegand.

On the evening of March 13th, the Association tendered a reception to the graduating class and their friends, at the hall of the College, the retiring President, Dr. A. W. Miller, in the chair. The recent graduates, having been formally admitted

to membership, Chas. L. Eberle, Ph.G., delivered the annual address. The alumni prizes were then distributed, Mr. J. L. Webber receiving the gold medal, and Messrs. H. Schroeder, L. Emanuel and J. Ritter the Alumni Certificates, for having received the highest average in Chemistry, Materia Medica and Pharmacy. To give to the older graduates and other friends present an opportunity of witnessing the working of the oxyhydrogen lantern as a means of instruction, Professor Remington exhibited with it a number of crystallizations and color reactions, and Prof. Maisch photographic representations of starches and other pulverulent drugs, and with the microscope attachment, sections of a number of drugs. Mr. Bullock entertained the company by showing a large number of scenes of this and of foreign countries.

THE NEW YORK COLLEGE OF PHARMACY held its Forty-sixth annual commencement on the evening of March 21st, at Chickering Hall, when President P. Balluff conferred the degree of Graduate in Pharmacy upon the following gentlemen :

Adolph Basora, Santiago, Cuba,	Alexander M. Linnett, Newark, N. J.,
Lewis Blumauer, Portland, Oregon,	William Maass, Ixonia Center, Wis.,
Clarence F. Booth, Newport, R. I.,	Thomas J. Magee, New York,
James P. Boyle, New Canaan, Conn.,	Ewen McIntyre, Jr., New York,
Augustus R. Castano, New York,	James Millar, New York,
H. Lieber Coit, Newark, N. J.,	James K. Morrill, Holyoke, Mass.,
Albert Dovell, Newark, N. J.,	Adrian Paradis, Union Hill, N. J.,
George Eberhardt, Rutherford Park, N. J.,	George F. Payne, Macon, Ga.,
Frank H. Falkenreck, Elizabeth, N. J.,	Henry F. Pembleton, Brooklyn, N. Y.,
George C. Fountain, Jersey City, N. J.,	Benjamin F. Quackinbush, New York,
Otto T. Frohwein, Elizabeth, N. J.,	Gustavus Rothe, Jersey City, N. J.,
Albert T. Gunther, Newark, N. J.,	Henry C. Schranck, Milwaukee, Wis.,
John C. Heidingsfelder, New York,	Peter J. Schumann, Atlanta, Ga.,
Adolph Henning, Union Hill, N. J.,	Theodore A. Spear, New York,
Frederick Huehne, Rondout, N. Y.,	Louis L. Staehle, Newark, N. J.,
Gilbert P. Knapp, New York,	Henry A. Striker, Amsterdam, N. Y.,
Otto G. Laue, Passaic, N. J.,	Theodore Thieme, Fort Wayne, Ind.,
Henry Lehman, New York,	Joseph E. Tomas, Brooklyn, N. Y.,
William J. Liell, New York,	William H. Townsend, New York,
	John H. Wenzel, New York.

The Alumni Prizes were awarded by Professor Bedford, after which Professor E. Curtis, M.D., delivered an address, and Mr. H. L. Coit the Valedictory Address on behalf of the graduates.

THE ALUMNI ASSOCIATION OF THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK held its fifth annual meeting, Wednesday evening, March 15th, 1876, President Geo. C. Close in the chair. Some fifty members were present, and nineteen of the class of 1876 joined the Association.

The President, the oldest living graduate, read his annual address, and gave an

interesting account of the apothecaries and doctors who were prominent in this city when he graduated in 1831.

The Treasurer, Theobald Frohwein, reported \$205.80 cash on hand, and \$46.42 in the reserved fund. An election of officers was then held, which resulted in the choice of the following gentlemen: President, Ewen McIntyre. Vice-Presidents—Starr H. Huebler, Charles A. Robbins, Ph.D., Henry C. Schranck. Secretary, Prof. P. W. Bedford. Treasurer, Theobald Frohwein. Registrar, Lucien M. Royce. To fill vacancies in the Executive Board—Byron F. McIntyre, Thomas F. Main and Edward W. Runyon. Delegates to the American Pharmaceutical Association—Geo. C. Close, Theo. Frohwein, B. F. McIntyre, S. H. Ambler and L. M. Royce.

The President appointed the following Committees: On Papers and Queries—Messrs. Creuse, B. F. McIntyre and Runyon. On Publication—Messrs. Royce, Creuse and Ambler.

A letter of greeting from the Alumni Association of the St. Louis College of Pharmacy was read, and the Secretary was directed to write an appropriate reply, reciprocating the kind feelings expressed.

Prof. Bedford offered a resolution that the Association give in the future three medals, of gold, silver and bronze, to the students rating, respectively, first, second and third at the annual examination. The resolution was passed unanimously.

Mr. Creuse read a paper entitled "A New Explosive Mixture," which was referred for publication.

The meeting then adjourned to the College cabinet, where a bountiful collation had been prepared.

Prof. Bedford, on behalf of the Association, welcomed the class of 1876, who were the guests of the evening, telling them that on this occasion they might forget the caution taught by their motto, *cavendo tutus*, as there were no poisons here. After an hour very pleasantly spent, the company separated, well pleased with the work of the Committee on Entertainment.

The next meeting of the Association will be held in June, when the officers elect will be installed.

THE NEW YORK ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY held its monthly meeting March 7th, President Levering in the chair. Mr. Mitchell was elected a member. Nominations were made for officers, the election being held at the next meeting, April 4th.

Mr. Wood stated that hydrobromate of quinia, often erroneously called bromide of quinia, has been attracting attention of late, because of its ready solubility. Mr. Wellcome called attention to a paper read by Mr. Bullock, before the American Pharmaceutical Association, in which formulas are given for the preparation of many bromides and hydrobromates, the latter term being used for the compounds with alkaloids. Having been called upon to prepare a concentrated solution of quinia, to be used hypodermically for a patient unable to endure any other method of administration, he made a solution of *arabinate of quinia*, three minims containing one grain of the salt, which was used with convenience, causing no unpleasant effects locally, and giving satisfactory results in its action.

The subject of ointments was discussed at some length in relation to a suitable substitute for lard or simple ointment. Mr. Ritter (of the class of 1876, present on this occasion), had found a combination of white wax and castor oil to be not readily impaired, and furnishing a good substitute for compounds very susceptible to change. Glycerite of starch and glycerin, solidified with gelatin, were also discussed in this connection.

Mr. Wellcome reported the case of Hon. L. Porter, of Minnesota, who drank from a bottle supposed to contain currant wine, but when too late discovered that he had taken a draught of solution of corrosive sublimate, kept for killing bed-bugs, and containing about 15 grains of the poison. The administration of white of eggs, lard, &c., under the direction of skilled physicians, proved unavailing, and the patient died after five days' suffering.

MASSACHUSETTS COLLEGE OF PHARMACY.—At the annual meeting, held March 6th, the following officers were elected: President, Samuel M. Colcord; Vice-Presidents—Charles A. Tufts, Thomas L. Jenks; Corresponding Secretary, George F. H. Markoe; Recording Secretary, Daniel G. Wilkins; Treasurer, E. L. Patch; Auditor, W. S. Folger; Trustees—James S. Melvin, Henry W. Lincoln, B. F. Stacy, I. T. Learey, I. B. Patten, Henry Canning, S. C. Tozzer and George H. Cowdin. The affairs of the College were reported to be in a good condition. A new charter has just been obtained from the Legislature.

THE ST. LOUIS COLLEGE OF PHARMACY held its tenth annual commencement March 23, when President F. X. Crawley conferred the degree of Graduate in Pharmacy upon the following gentlemen: Flor. C. Schmidt, Robt. Hunstock, A. Ph. Kaltwasser, J. N. Washington, F. Westmann, O. E. H. Truetler, L. Riesmeyer, Chas. Luedeking, N. Guhmann, Jr., Paul Nake, Gust. Brandau, H. Schwarz, Herm. Brandt, Jr., and H. Harnisch.

Prizes were awarded by Prof. Good, and valedictories delivered by Prof. Fay on behalf of the faculty, and by Mr. Washington on behalf of the class.

The graduates were then received by the Alumni Association, and the exercises terminated with an oration by Francis Hemm, Ph.G.

EDITORIAL DEPARTMENT.

THE ASSERTED PRESENCE OF TANNIN IN GENTIAN ROOT.—In a paper bearing this caption, published in our last number, we took occasion to refer to the report on a paper read before the Massachusetts College of Pharmacy, from which we were led to infer that the assertion concerning the presence of tannin in gentian was mainly based on the incompatibility of the tincture of chloride of iron and compound tincture of gentian. Mr. E. L. Patch has kindly sent us the paper read by him, from which it is evident that the report referred to above was very incomplete, and that the experiments with gentian alone were in reality the most important of his investigations, the results of which agree entirely with those related in our last number. Mr. Patch had *not* overlooked the fact that orange peel produces

an inky coloration with salts of iron; he ascertained, even, that its infusion yields a slight precipitate with gelatin; he likewise noticed that the same reagent produces with infusion of gentian a slight precipitate, which at first sight may readily be mistaken for tannate of gelatin, since, after draining, it will be colored nearly black by iron salts; this color, however, is completely removed by washing with cold water. A very interesting experiment, which, in our opinion, likewise disproves the presence of tannin, was performed by Mr. Patch, by exhausting moistened gentian with washed ether and evaporating; the resulting extract was treated with alcohol, and this solution was found to behave to iron salts in a similar manner as tannin; yet, on throwing it into water and filtering, the clear liquid, which should contain any tannin present, was *not precipitated* by gelatin. In his paper Mr. Patch stated that he did not regard his experiments as concluded, but would continue his investigations. Since then, Mr. L. D. Drury has read a paper before the Massachusetts College of Pharmacy, in which he arrived at the same conclusion as the paper published in our last number.

THE PILL QUESTION.—On February 18th, we received a communication from Mr. Dunton, which we could not notice in our last number, and in which he objects to the conclusions arrived at by Mr. Remington in his paper read before the American Pharmaceutical Association. The points relating to the question at issue are contained in the following:

In 1869 I called the attention of the medical profession to the advantages of the compressed pill, viz. that—

First. No extraneous substances are added to produce cohesion, such as gum, sugar, starch, soap, &c., which are usually employed in making up pill masses, and often detract from the solubility of the pill, while they add to its bulk.

Second. Their form is lenticular instead of round; they consequently present a larger surface to be acted upon, and are more promptly effective. Experience has shown, also, that pills in this shape are very easily swallowed.

This statement in reference to the solubility of the pill was made after a full examination of the subject, by frequent comparative tests, made by myself or under my supervision, with pills made from every excipient known to us, and also with those purchased from leading pharmacies. Never, in any instance, did we find, under like circumstances, an excipient pill dissolved as soon as the non-excipient or compressed pill.

To avoid the republication of the entire paper, Prof. Remington has, at our request, embodied in his reply to Mr. Campbell the essential portions of his paper, so as to enable every intelligent reader to form a judgment, or to repeat the comparative experiments for himself. With these remarks we feel that we can leave the matter to the decision of our readers.

THE DRUGGISTS OF MINNESOTA, we have been informed, are taxed under a State law ten dollars each, for the support of the State Inebriate Asylum. Why the Solons of that State have specially selected the druggists for such forced contributions is unknown to us. It cannot be that, as a class, they are guilty of keeping tippling-houses, nor because, under the internal revenue law of the United States, apothecaries and druggists are compelled to take out a liquor dealer's license. The druggists have recently assembled at Minneapolis to protest against that law as an outrage; and in their attempt to secure its repeal deserve the good wishes of all.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Medicinal Plants; being Descriptions with Original Figures of the Principal Plants employed in Medicine, and an Account of their Properties and Uses. By Robert Bentley, F. L. S., and Henry Trimen, M. B., F. L. S. Philadelphia: Lindsay & Blakiston, 1876. Price of each part, \$2.00.

Parts 2d and 3d of this valuable work, now before us, contain figures and descriptions of the following North American plants: *Lobelia inflata*, *Gaultheria procumbens* and *Sanguinaria canadensis*. The remaining plants noticed in the two parts are *Theobroma cacao*, *Rhamnus catharticus*, *Prunus amygdalus*, *Pyrus cydonia*, *Cinnamomum zeylanicum*, *Papaver rhoeas*, *Barosma crenulata*, *Citrus aurantium*, *Olea europæa*, *Juniperus communis* and *Iris florentina*.

We notice that the fusing point of cacao butter is given at 122° F., and its specific gravity .961. Other authorities give the spec. grav. .891 to .91, and the fusing point at about 30° C., (96° F.)—See also Trojanowsky, next page. While it is not unlikely that different varieties of cacao, expressed at different temperatures may yield fats varying in fusing point and density, we are not aware of any comparative experiments undertaken with the view of ascertaining the causes producing the differences which are noticed between the cacao butter of former investigators and that usually met with in commerce.

Among the constituents of sanguinaria, puccina and sanguinarinic acid are given, the former of which Hopp proved to be (*Amer. Jour. Phar.*, 1875, p. 193,) sanguinarina mixed with a little resin, and the latter to consist mainly of citric and malic acids.

The representations of the plants and the descriptive letter-press are very commendable.

Gmelin — Kraut's Handbuch der Chemie. Anorganische Chemie. Sechste umgearbeitete Auflage. Heidelberg: Carl Winter's Universitäts Buchhandlung.

We have before us Nos. 6 to 10 of vol I. part I; Nos. 5 and 6 of vol. II, and Nos. 17 to 20,—the conclusion of the third volume.

The five numbers belonging to the first volume contain the continuation of the general and physical chemistry, among which is the chapter on crystallography and an exposition of the physical laws bearing on solids and liquids, and relating to elasticity, expansion, density, influence of and behavior to heat, dissociation, capacity of absorption and solution, etc.

The two numbers of the second volume are devoted to the metals of the alkaline earths barium, strontium and calcium, and the concluding numbers of the third volume to the metals of the platinum group, namely, platinum, palladium, rhodium, iridium, ruthenium and osmium. The preparation of the last volume for the press consumed a period of over four years, and has been in the hands of Professor S. M. Jørgensen, of Copenhagen, who has admirably fulfilled his trust to bring the work up to the time of publication, which, in view of the numerous additions and of the more extended and perfected theoretical knowledge necessitated the re-writing of the greatest portion of the work. The same must be said of the second part of the first volume, containing the non-metallic elements, which was finished some time ago, having been revised by Professors H. Ritter and Carl Kraut. What remains to be finished is the first part of the first volume, containing the general introduction into chemical science, and the second volume embracing the metals of the alkalis, alkaline earths and earths. The former, of which now ten numbers (608 pages) have been published, is entrusted to Professor A. Naumann, of Giessen, a scientist eminently qualified for the task from his connection with the "Jahresbericht der

Chemie," (annual report on the progress of chemistry) for which he has elaborated the same branch since 1867. The second volume is in charge of the editor of the entire work, Professor Kraut, of Hannover, who completed Gmelin's organic chemistry with its supplements in 1870. The completion of the inorganic chemistry may now doubtless be looked for in a short time.

Ueber die wesentlichen Bestandtheile von Gelsemium sempervirens. Von Dr. Chas. A. Robbins. Berlin, 1876.

On the proximate principles of *Gels. sempervirens*.

The results of the author agree in the main with those previously obtained by Professor Wormley (*Amer. Jour. Phar.*, 1870, p. 1.). The gelseminic acid of the latter was found by Dr. Robbins to be identical with aesculin, and the amorphous gelseminia, for which the empirical formula $C_{11}H_{19}NO_3$ was obtained, was observed to have the reactions noticed by Wormley; but a solution of gelseminia in concentrated sulphuric acid acquires, on the addition of potassium bichromate, particularly at the place of contact, a very characteristic cherry-red color having a tint of violet and changing to blueish-green. The sulphuric acid solution of gelseminia spread over a porcelain plate acquires, on the addition of ceroso-ceric oxide, a rose-cherry red color surrounding the oxide, and spreading over the entire surface after stirring with a glass rod. This reaction is quite characteristic and very delicate.

The resins, freed from gelseminia, were found to be destitute of poisonous action upon rabbits and pigeons.

Ein Beitrag zur Pharmacognostischen und Chemischen Kenntniss des Cacaos. Von Piers Trojanowsky. Dorpat, 1875.

A Contribution to the Pharmacognostical and Chemical Knowledge of Cacao.

This inaugural dissertation, for which the experiments were made in Prof. Dragendorff's laboratory, treats, in the first part, of the pharmacognostical relations, giving brief historical notes, botanical accounts, notes on the culture and descriptions of the twenty commercial varieties investigated by the author.

The second, or chemical part, contains a review of the various analyses, which is followed by the quantitative determination of theobromina. This was effected by first treating the coarsely powdered material with petroleum benzin, to remove fat; the residue is then rubbed with powdered glass and water to a fine powder; magnesia is added, and the mixture dried below 70° C. This residue is exhausted with two portions of boiling alcohol, and the filtered solution evaporated; a little fat and a minute amount of a crystallizable body are removed by petroleum benzin, the undissolved portion washed upon a tared filter with alcohol until the filtrate is nearly colorless, and the residue weighed as theobromina; to this weight is added the amount of alkaloid dissolved in the alcoholic washings (1 in 1460). In this manner the author obtained from the cotyledons of a Domingo cacao 1.205 and from an African cacao 4.652 per cent. of theobromina. Different samples of the same commercial varieties yielded, however, very different amounts. The shells of the same varieties, mentioned before, gave respectively 2.056 and 4.540 per cent. of theobromina, the smallest yield being obtained from the shells of a Soconusco cacao = 0.866 per cent.

The amount of fat obtained by petroleum benzin varied between 39.30 per cent. from a Carracas and 52.05 per cent. from a Surinam cacao. The fusing point of the cacao butter, determined in capillary glass tubes, varied between 30° C. = 86° F. (Brazil cacao) and 32.8° C. = 91° F. (St. Lucia cacao). To determine whether cacao butter has been adulterated with other fats, the author recommends the process proposed by Björklund, in 1864. Two grams of the fat are dissolved, by agitation, in a strong glass tube, in 4 grams of ether of 17° C (62.6° F.); the tube is

then immersed in water of 0° C. (32° F.) Pure cacao butter commences to separate granules after three (Para c.) or five minutes (Puerto Cabello and Caraccas c.), or the solution began to become turbid after eight (Trinidad, Guayaquil and Surinam c.), or fifteen minutes (Domingo c.) The solutions of Martinique and Bahia cacao butter remained clear after twenty-five minutes. If the cacao butter had been mixed with 5 per cent. of tallow, the ethereal solution became turbid in one minute; 5 per cent. of suet rendered it turbid in $2\frac{1}{2}$, 10 per cent. in 2, and 20 per cent. in one minute; with 40 per cent. suet, the solution became turbid at once in the cold water.

The amount of starch was determined as sugar, and found to vary between 2.23 (Para c.) and 6.65 per cent. (Soconusco cacao).

The author has also examined the behavior of the alcoholic tinctures of the different varieties to various reagents, and, based upon his results, suggests a method of determining the commercial variety of cacao from its behavior to such reagent.

The amount of ashes obtained from the cotyledons varied between 2.08 (St. Vincent c.) and 3.93 per cent. (Guayaquil c.). The shells yielded from 4.67 (Dominica c.) to 19.27 (Carracas c.) per cent. of ashes.

To determine the quality of chocolate, the amount of ashes must not much exceed 3 per cent., the fat (to be tested with ether, as above stated) not less than 40 per cent., and the starch not over 7 per cent., in all cases after deduction of the sugar.

Beiträge zur Chemie der Eichen-, Weiden- und Ulmenrinde. Inaugural Dissertation von Edwin Johanson. Dorpat, 1875. 8vo, pp. 94.

Contributions to the Chemistry of Oak, Willow and Elm Barks.

By his interesting experiments, the author has proven that the tannin of oak and willow barks may be made to yield a crystalline body which possesses all the reactions of gallic acid. Wagner's distinction, made in 1866, between a pathological and physiological tannin is therefore incorrect. By a similar treatment of the tannin from *Ulmus campestris* no crystalline body could be obtained. In the course of his investigation the author obtained from willow bark *benzobelicin*, which Piria gained in 1852 from populin by treatment with nitric acid. This is the first observation of the existence of this body in a plant.

Proceedings of the Seventh Annual Meeting of the California Pharmaceutical Society; also, of the Third Annual Meeting and Commencement Exercises of the California College of Pharmacy. San Francisco, 1875. 8vo, pp. 76.

The pamphlet before us contains, besides the minutes, officers' reports, prospectus, &c., two papers, read before the Society: "On Ethics of the Profession," by E. Painter, and "On Suppositories," by G. G. Burnett, the latter advocating their preparation from powdered cacao butter, by hand, with the aid of a spatula. A third paper, "On Syrup of Ferrous Iodide," by M. Tschirner, was published in this Journal last year (p. 249).

The commencement was noticed on page 572 of our last volume. In the pamphlet we find the valedictory address by Prof. Searby, and abstracts from two theses: "On Sesame Oil," by R. C. Meyers, and "On *Oxytropis campestris*," by T. D. Graham.

Wildungen, its Baths and Mineral Springs. By Dr. A. Stoecker. Translated from the German by Chas. Harrer, M. D. London: Trübner & Co.; New York: E. Steiger. 1875. Pp. 40.

The pamphlet gives a brief account of these well-known springs, their medicinal properties, composition, &c.

THE AMERICAN JOURNAL OF PHARMACY.

MAY, 1876.

ON SOME MEDICINAL PLANTS OF GREECE.

BY PROF. X. LANDERER, ATHENS.

Allium.—Garlic was used in ancient times for culinary and medicinal purposes, and has preserved its reputation to the present day. The bulb, 'αγλίδες, was originally used as a prophylactic against witchcraft and enchantments, and god-fathers attached it to the bodies of babes named after them. The species of allium cultivated in oriental countries are *Allium sativum*, *A. subhirsutum*, *A. descendens*, *A. Porrum*, *A. Schoenoprasum*, *A. Ceba* and *A. Moly*, the latter having been extensively used as a protection against the evil influences of the renowned enchantress, Circe. The onion is largely consumed in the Orient; together with bread, it forms the principal nourishment of the poorer classes, and, with grapes, tomatoes, olives and wine, it constitutes the sustenance of thousands of travelers in the summer time from morning till night.

Asphodelus racemosus and *bulbosus* are interesting plants, known from the remotest time. Being found in cemeteries, it was consecrated to Persephone and the divinities of Hades. Its principal use was against the bites of venomous insects, snakes and scorpions, and in inflammation of the testicles. A very strongly adhesive substance is prepared from these bulbs, in Turkey, by exsiccating them thoroughly, in suitable ovens, when they acquire the glutinous properties of dextrin, and are employed as paste by bookbinders and shoemakers. Pythagoras called the plant Πανχράτιον, pancration, a plant governing all, or possessing all properties. This name was adopted by Linnæus for *Panocratium maritimum*, which grows near the sea coast, and the bulb of which is not unfrequently exported as an admixture of squill; its flowers are very beautiful and have a delicious odor. The bulb of it and of *Scilla maritima*, boiled with honey, are esteemed as excellent reme-

dies in chronic bronchitis and pulmonary consumption, and it is said that by the use of these remedies Pythagoras had extended his life to 134 years. From Theognis we have the proverb "e scilla non nascitur rosa." The name scilla, not *squilla*, is derived from the Greek verb *σκιλλῆν*, because the bulb can be readily divided into small pieces or scales.

Lagoecia cuminoides is commonly called lagokoimitia or hare's bed (*λαγῶς*, hare), because the young hares are said to be always found hidden under this plant, which is esteemed in the Orient against nephritic lithiasis.

Ceterach officinarum, Willd.—Many years ago, when I was examined, the question was asked, whether sterility could be produced, to which I answered, "No, except by abortifacient medicines, such as savin, ergot, powerful drastics and emmenagogues." Some years ago a midwife was accused of having given to a rich lady some medicine to prevent her bearing children. Several plants having been sent to me for examination, I found among them the one mentioned above, which is the *Asplenium Ceterach*, Lin., and which appears to be employed for the purpose indicated; its effects, however, remain to be examined.

Dictamnus creticus.—This plant is indigenous to the island of Crete, where the flowers and leaves are collected, tied up in small bundles, and sold as an excellent remedy against dysmenorrhœa and amœnorrhœa of young women. In ancient times it enjoyed a very great reputation in many ailments of women, and it is to be regretted that it, like many other useful plants, has been neglected in modern times in favor of others not possessing the same virtues; but it is still employed to some extent as a reliable emmenagogue, together with the well-known and highly esteemed *Ruta graveolens*.

Sonchus oleraceus.—The ancient name (*sonchos*) of this plant is derived from *ζωηγέειν*, life-giving. It has enjoyed a high repute for its medicinal properties among the ancient authors, Theophrastus, Pliny, Dioscorides, &c. "Sonchus quod succum salubrem fundit qui stomachi rosiones lenit et nutricibus lac augit." For these reasons, the plant is boiled and eaten with oil, and nursing women apply it in the form of cataplasms, with the view of augmenting the secretion of milk. The plant is greatly esteemed in diseases of the liver, particularly in jaundice.

Guscuta epilinum, *Toad flax*, is a parasitic plant found upon *Satureja*

and Thymus, the latter of which is frequently completely covered with it. It occurs, also, often upon the flax (*λευνον*), whence is derived its specific name, epilimon. It was recommended by Pliny in dropsical affections, in which it is still employed, also in angina and gouty complaints.

Nerium Oleander.—This beautiful plant is called in Greece rhododaphne (from *ῥόδον*, rose, and *δάφνη*, laurel or bay), or rose bay, and picrodaphne (*πικρός*, bitter), or bitter bay; the name nerion, *νήριον*, is derived from *νηρός*, humid, and indicates a water-loving plant, because it grows in moist places. When taken internally, the extreme bitterness nearly always produces nausea; but, after long-continued use, it has been found to be of some value in epilepsy, by reducing considerably the frequency of the paroxysms, although not effecting a complete cure.

Anagyris fœtida is a leguminous tree, the leaves of which have purgative properties, and are employed by the peasants like senna, under the name of pseudo-sinamiki, false senna leaves. When the leaves are rubbed between the fingers, their very offensive odor is developed, which is likewise perceived when the tree is shaken either by hand or by the wind. This is the origin of the Greek proverb, "*Ανάγυριν κινῆς—μή ανάγυριν*," which has been in use from very remote times, and which signifies (Do not shake the anagyris), to avoid stirring up unpleasant affairs which in the course of time have been forgotten. The fruit having a resemblance to beans, they are called agriophaselo, or wild beans, in the island of Cyprus.

Atractylis gummifera, by the ancient Greeks called *chamaileon*, is a handsome, thistle like plant, yielding an exudation, which is collected by women and children, and sold as pseudo-mastich or acantho-mastich. The pieces, consisting of agglutinated tears, are oblong in shape, and usually about two inches in length by one inch in thickness. Its root bears some resemblance to celery and parsnip, and is occasionally mistaken for these esculent roots. In the island of Melos four children were poisoned and died last year from eating the root of this plant, and another case had occurred, a few years ago, in the island of Mykonos.

The holy plants Verbenæ.—Not only the genus which at present bears that name, but medicinal plants generally, were in olden times known by the name of *verbena*, i. e., *ἱερο βοτανή*, hierobotane, or holy plants,

because they enjoyed great reputation amongst the Greeks and Romans against execrations, apparitions, witchcraft and other demoniacal influences. The priests using these plants were called *verbenarii*.

Arum Dracunculus, maculatum, &c.—All plants which, in their flowers or roots, either by color or form, have some resemblance to a snake or scorpion, are called ophidochorton (ὄφις, a snake), ophidobotanon, or skorpidochorton. Such plants are *Heliotropium hirsutum*, *Scolopendrum officinale*, *Lithospermum apulum*, *Echinum vulgare*, and principally *Arum dracunculus*, so named from its resemblance in color to the skin of some serpents and the tiger; its horrible odor resembles that of the cadavers of some animals. All the above-named plants are used in the Orient by the common people as a prophylactic as well as a cure of the bites of venomous snakes and scorpions, which, in Greece, have frequently resulted in death.

Eruca sativa is extensively cultivated in oriental countries as a pot-herb and salad. The seeds, which have a biting flavor when masticated—hence the name from ἐρω, I draw—are collected in Macedonia and often exported to France, where they are probably used as an admixture to white mustard.

Cataplasms are almost universally employed in all oriental countries, and are popularly resorted to as the beginning of the treatment in nearly all complaints. The principal articles used for this purpose are flaxseed and mallow flowers, okra fruit (*Hibiscus esculentus*), Corinthian raisins and figs; a mixture of wax and honey is likewise frequently used. Against the bites of venomous snakes and scorpions, the leaves of *Solanum Melongena*, called meltsanes, are used in the form of cataplasms, besides the various parts of plants mentioned above, which appear to be used mainly on the principle: *Similia similibus curantur*. Cataplasms are often made with wine, and with wine must and milk.

A very curious cataplasm was used during the visit of the plague for accelerating the suppuration of the buboes; it consisted of a mixture of caviar and flaxseed, and was used with good success, upon the advice of the nurses, in my own case, after having been infected by a pestilential cat in the island of Paros, where I had been sent by the government to assist in arresting this horrible disease.

The fever plant, *thermochorton*, in the times of Hippocrates was the lesser centaury, *Erythræa centaurium*, which is still used with marked

success in the chronic fevers of oriental countries; it is made into a strong decoction together with the leaves of the olive tree. The name of the plant is supposed by some to be derived from *Κένταυρος*, centaur, while others refer its origin to the words *centum*, a hundred, and *aurum*, gold, signifying a plant worth a hundred gold pieces.

In this connection it may be stated that there are annually consumed in Greece about 20,000 kilos, and in all the oriental countries over 500,000 kilos of sulphate of quinia.

PRESSED HERBS.

BY J. U. LLOYD, CINCINNATI, O.

Herbs are pressed to reduce their bulk, they then are compact, require but little space for storage, and are easily handled. If I mistake not, I have named about the only advantages pressed herbs possess over loose.

My experiments teach me that they deteriorate nearly, if not quite, as rapidly when pressed as loose. In either case, they are exposed to the action of the atmosphere, and the decomposing effects of the moisture with which it is usually laden. Insects attack both. Pressed herbs, without a doubt, mould quickest. Excepting the mere matter of bulk there is no inducement for pressing herbs. Common paper bags, or even cotton sacks, will preserve them as well. The desideratum of the day is a process for preserving the delicate medicinal principles of our herbs from season to season. If this can be accomplished, in conjunction with compactness of form, so much the better, otherwise let us choose quality first, even though it be at the sacrifice of convenience in handling.

In the proceedings of the Amer. Pharmaceutical Association, 1875, we find an article from the pen of Mr. A. W. Miller, upon an improved method for preserving herbs, said improvement being the substitution of pasteboard boxes for paper. The herbs, instead of being pressed by the dealers into compact masses, as is now customary, are, by the pharmacists themselves, firmly packed into the box by hand, remaining loose enough to admit of examination at any time. In my opinion, the important point in connection with dried herbs is preservation, not convenience. Is there any advantage to be derived, in this respect, from the substitution of pasteboard boxes for our machine

presses, or even paper or cotton bags? Will boxes prevent the ravages of insects, or preserve the delicate organic principles upon which many of our herbs depend for their medicinal values? This is the direct issue, not convenience in packing and the value of shelf room.

Personally, I have met with many aggravations respecting loose and pressed herbs, barks and roots, as found upon the market. Necessity has compelled me to experiment upon their preservation. The subject is very important to every druggist and pharmacist, and I feel that a brief description of the most successful of my experiments will be of interest to many readers of the "Journal." To preserve herbs with any satisfaction, I was compelled to use air-tight tin cans. Gather the herb when in its prime, quickly and carefully dry it, then, by hand, press it into the can, sprinkle upon it chloroform, in the proportion of half an ounce to each pound, replace the cover immediately and render the can air tight by painting the edges with melted beeswax. Herbs like peppermint, spearmint, &c., which depend for their virtues mostly upon delicate essential oils, can be nicely preserved in this way. Roots and herbs that are particularly liable to the attacks of insects, *e. g.*, parsley root, burdock root, motherwort, will show no sign of their presence. Is there any objection to chloroform in this connection? I think not; it is quickly dissipated when exposed to the atmosphere; it certainly is of much value, insect life being destroyed by its vapor; without it, even though in air-tight cans, specimens will be attacked. Aside from this, I believe the vapor of chloroform exerts a preservative influence over most of the delicate proximate principles of our plants.

Any druggist can have tin cans made to order, at small expense; with careful handling they will last many years, being refilled each season. Of course the process necessitates some trouble, and when the customer is waited upon, a little time must be consumed in replacing and waxing the cover. It is time well employed, however, for the majority of customers will prefer paying double the price of ordinary herbs for those preserved in this manner.

The season is now approaching for replenishing the stock of botanical specimens. This stock must last until next year. Druggists can gather many articles they will otherwise be compelled to purchase. Pharmacists who knowingly will not allow a grain of other inferior and adulterated medicines to enter their stores, are compelled to dis-

pense from their counters, each year, a large amount of old and worthless pressed herbs, often mouldy, and usually full of stems, sticks, dirt, &c. They must take what the market affords, unless they gather prime articles at the proper season. But it may be well to remember that prime herbs in August are entirely different materials the following January, unless precautions are taken to preserve them.

The process of preserving herbs in tin cans, by means of a little chloroform, was suggested to me by the late Prof. W. B. Chapman, of this city, who had met with remarkable success in applying it to ergot.

MODERN METHODS IN PHARMACY.

BY JOHN F. HANCOCK.

In considering a subject, the mind should not be fettered by prejudice, nor should a new method or invention be condemned before the application of careful tests. The pharmacist who desires his profession to be progressive, should encourage invention and discovery, and adopt methods which lighten his labors by facilitating neatness and accuracy in manipulation and expedition in the dispatch of business. The term "Elegant Pharmacy" is frequently misapplied, but we often notice elegance in quality and style of many preparations, which mark a striking contrast between *old* and *new methods*. Elegance consistent with accuracy, should be aimed at by all pharmacists who hope to excel in their calling. The primitive forms in which medicines have been presented, are very much modified through the influence of science and education. The old-fashioned decoctions and infusions have been displaced to a great extent by tinctures, fluid and solid extracts; but these preparations, though vastly superior, were not much favored at first. The increase of chemical knowledge has developed methods by which crude drugs have yielded their active principles in a pure and concentrated form.

The old style "bolus" has lost its repulsiveness by the process of extraction, and its offspring, the modern pill, in being prepared of extracts, alkaloids, resinoids, etc., is unobjectionable in size, and rendered more acceptable by the process of coating with sugar or gelatin, so that in its transit to the stomach, the palate is not offended. The forms of medicines known as granules, pearls, dragees, globules, capsules, cachets and compressed sugar and gelatin coated pills, are of

recent introduction, and mostly of French origin. Thus by modern methods in pharmacy, nauseating remedies are relieved of disagreeable taste. Medicines in powder form are now placed between two concave wafer discs, and in the cachet thus formed, can be swallowed without the slightest inconvenience. Another important class of modern remedies are the chemicals. Many of these are administered in the form of solution, which is sometimes objectionable in many cases, owing to their disagreeable taste. The essential oils and balsams are also frequently objectionable on this account, in consideration of which the artistic pharmacists of France devised new methods which have been largely imitated in this country by manufacturing pharmacists.

An English writer, referring to the practice of pharmacy in France, calls it the "Pharmacy of Sugar." Careful inquiry will disclose the fact, that the pharmacy of science and art would be the more appropriate term; for they not only include sugar largely in their preparations (thus wisely employing the confectioner's art, when practicable), but have taken an original step in the introduction of soluble gelatin or gluten capsules, as a vehicle for the administration of nauseous remedies. Although this art is being imitated in the United States, the results do not compare with those of the French; at least, we have not met with medicated gelatin capsules made here with liquid contents that favorably compare with those furnished by the importers of French medicines. Those who examine these medicated globules are pleasantly impressed with their neatness of finish, regularity of size, transparency, and the complete manner in which each globule is filled. The attractive form in which French remedies are presented constitute them formidable rivals of the delectable homœopathic granules. French pharmacists employ the culinary art also—even that of sacred origin; for, doubtless, the use of unleavened bread, suggested medicine wafers which idea has been brought to a high degree of perfection by M. Limousin, of Paris, in the introduction of concave wafer discs. The preparation of "cachets de pain," is a new method in pharmacy of utility and importance, which when understood, will be generally appreciated. These envelopes of bread afford the most convenient means extant for the extemporaneous and tasteless administration of medicines in powder form. With the press and wafers, prescriptions can be conveniently and expeditiously dispensed in a tasteless form, when it would be impossible to do so by any other convenient means.

A review of the history of the introduction of "cachets de pain" in this country, will explain the opposition that has been urged against them. If we are correctly informed, a pharmacist of a Western city, on a visit to Paris, saw the cachets, and being informed of their popularity, obtained from M. Limousin a lever press and wafer discs, which he successfully introduced into his own trade. Recognizing merit in the method, he imported more of the discs, with a view of selling them to the profession; but instead of importing the presses of Limousin, and continuing to import his wafer discs, which leave nothing to be desired, arrangements were made to supply presses and discs of home manufacture, greatly inferior to the French, and at prices higher than Limousin's should have been sold for.

This condition of things engendered opposition, and, in our opinion, prevented the general adoption of the method, or at least, made it unpopular with some. The press and wafers of American manufacture, which we have seen, are not to be compared with Limousin's; hence, we are not surprised that the former should not be received with favor.

The time consumed in the preparation of cachets is urged as an objection to their use. This, time and experience will overcome, for it matters not how skillful the operator, the application of any new method will be found troublesome at first. Skill is the result of observation and experience. In this connection we will briefly review an essay on "cachets de pain," in the "American Journal of Pharmacy," vol. xlviii. No. 3, p. 100. The writer refers to them as "wafer discs found in the market under the name of cachets de pain." To be correct, the wafer discs are the material used in preparing cachets de pain (envelopes of bread). These, when enclosing medicines, are known as medicated cachets (*cachets medicamenteux*). The writer calls the method the "theory of the inventor," which is incorrect, for when a fact is demonstrable, as this is, it cannot be called a *theory*.

The writer's directions for preparing the cachets, and his mode of administration, deserve notice. The edges of each disc should not be moistened, as he recommends, but the marginal edges of *one* only, and that very slightly (experience is worth something at this point), and in taking the cachets, if properly moistened, no trouble is experienced in swallowing them. If properly prepared, they will not adhere to the press, nor to each other when placed in a box, as mentioned by the essayist; neither will they "cleave to the roof of the mouth" if properly

moistened. He mentions the time necessary for their preparation as being five times greater than that required for preparing pills and powders. Such has not been our experience, hence, we conclude from his remarks, that he is not skilled in the art of preparing cachets, and for fear that fallacious impressions may be made on the minds of those who have not examined the subject for themselves, we deem it expedient to controvert his statements.

The word *theory* is again used in his endeavor to condemn cachets de pain. In concluding the dissertation, in order to strengthen his objections, he observes: "This is not only my personal experience, but that of several physicians of this city, who, having submitted this method to fair trial, have arrived at the conclusion that cachets de pain are a failure."

We were the first to prepare cachets de pain in Baltimore, and at a period previous to their introduction in any of the Eastern cities; the press and wafers of Limousin only being used. They have been regularly dispensed since their introduction, and are highly esteemed by physicians. After a little trouble at first, no inconvenience has been experienced with them,—the time consumed in their preparation being very little more than that required for pills and powders; and accidents, such as recorded by the writer, we have never encountered.

We concluded to repeat the experiment of the writer with cachets containing effervescing salts. One cachet was prepared with a mixture of tartaric acid and bicarbonate of sodium, another with citric acid and carbonate of potassium. As usual, after joining the edges of the discs, they were quite dry in a few seconds. On being placed separately in water, they became perfectly flacid, but several cachets could have been swallowed before any sign of rupture or effervescence was noticed. The recommendation of Planten's jujube paste capsules, as a preferable means of administering medicines in a tasteless form (particularly if in powder), convinces us of the writer's lack of familiarity with this method. The capsules will not compare with the wafer discs in point of economy or convenience, nor can they be as expeditiously prepared. However, they answered an excellent purpose, until Limousin placed his unique press and concave wafer discs within the reach of pharmacists, and even now, may be preferred in a few cases. Therefore, we cannot conclude with the writer, that cachets de pain, of the kind we dispense, "will soon be referred to as a thing of the past," but, on the contrary, like many other innovations, strongly opposed at first, will in

time receive a most favorable notice, and be largely employed in dispensing the preparations of physicians.

Another method which meets with opposition, but promises to grow in favor, is the process of preparing compressed pills, for which a convenient and inexpensive machine has recently been placed within reach of the entire profession. No doubt, compressed pills will be of limited application, but for such substances as bicarbonate of sodium, bicarbonate of potassium, bisulphate of quinia, and the like, it is preferable to the old method. This form of pills is not new, as in England and the United States they have been known for many years, but heretofore they had been prepared exclusively by the few.

Lastly, though not least, of the methods in pharmacy, which may be termed modern, is the moulding of suppositories. These are not a new class of preparations. We have before us the Dispensary of Valerius Cordi, published in 1571, in which we find a formula for purgative suppositories, but from the very nature of the formula, we do not suppose them to have been the pretty things which are now called "suppositories," with due respect to those who prefer hand-made suppositories. We value the modern method of moulding as a great advancement in the art. Every pharmacist should endeavor to be supplied with the means of conducting his manipulations, according to the most approved *scientific and artistic methods*. Those who are not willing to incur the expense and inconvenience, should not throw obstacles in the way of progress. Who would be content to employ themselves in a shop furnished after the best model of the last century? No gas, no coal, no water, and destitute of a hundred other conveniences which science and art have brought to our aid. The old shop, with windows of bottled snakes, jars of rancid dog lard, snake oil, human fat and numerous other repulsive and unnecessary remedies, through the influence of science and art have been displaced by the modern palatial pharmacy, replete with chemical and pharmaceutical apparatus, and the introduction of new methods.

CACHETS DE PAIN.

BY WILLARD M. RICE, JR.

The use of these articles, comparatively new to American pharmacists, seems to be increasing to so great an extent, that I have thought a few practical notes on the subject would not be unacceptable to the

readers of the "Journal," although it has been so lately and so well treated of by others.

About the only possible objections to their universal introduction and use are those put forward by Mr. Lechler in the number for March last of this periodical, and as these objections have been successfully answered and refuted by Mr. Blair (April number), there is no need of further reference to them.

One objection to the general introduction of the use of cachets has hitherto been the cost of the press considered necessary for their preparation. I wish, therefore, to suggest a cheap, "home-made" apparatus, which, while it may not take the place of the more costly presses with those who may prefer and can afford them, will yet enable even the poorest in the ranks of our proverbially poor profession to possess a press, at a cost of only a few cents, which will turn out the cachets equal to the best.

I have prepared a great many cachets by the following-described machine:

A piece of hard wood, about six or eight inches long by four inches wide, serves for the base of the machine. In this fasten the lower dies (the brass buttons for stair-rods, as suggested by Mr. McIntyre, answer an admirable purpose, and can be had of exactly the proper sizes), one for each size of cachet. They should be sunk in the wood, so as to be on a level with the top. Similar dies are to be screwed to wooden handles, and the machine is complete. These handles, neatly turned, can be purchased at any hardware or house-furnishing store.

It will be seen that this machine differs from that figured in the "Journal" for January last, in having the upper dies attached to handles separate from the rest of the press. In using it, all that is necessary is to place an empty wafer on the die, place the medicine on it, cover it with another cachet, properly moistened, apply to this the upper die, and a very slight pressure upon this, or a tap with the handle of a spatula, is sufficient to cause them to adhere. In this way any number of complete cachets may be made in a very expeditious manner.

One word in regard to the proper moistening of the upper disk. There is no need of any complicated "wetter" for this purpose. A piece of flannel or muslin, wet and then wrung out, and folded two or three times, will be found to answer every purpose. Several of the disks may be laid upon this damp surface, to be taken up one by one

for the press, and they will be found to have absorbed sufficient moisture to make them adhesive, but none too much. My practice is to put them immediately from the press into a bottle, and I have never had to complain of too much moisture.

The polished brass dies are very easily kept clean, and the whole machine possesses the advantage of great simplicity, and will last for years, "with no expense for repairs."

The public are always ready to encourage legitimate enterprize, and in these days of elixirs, sugar pellets, &c., every pharmacist will find it conducive to his interests to introduce the cachets de pain to the notice of physicians and his customers.

I think the cachets may also be found useful for enveloping minute doses of liquid medicines, provided they exert no solvent action upon the envelope. I have never seen this suggested, but see no reason to doubt its practicability.

Philadelphia, April, 1876.

GLYCERIN AS AN EXCIPIENT FOR PILL MASSES.

BY LOUIS EMANUEL, PH. G.

(*From an Inaugural Essay.*)

As an excipient for pill masses, glycerin has been recommended in combination with starch or tragacanth for pills generally, and without any combination for pills of quinia and other chemicals. The latter was suggested by Dr. T. E. Jenkins in the "Amer. Journ, Pharm.," 1869, p. 119. However, little or nothing has been said of its advantageous use as an excipient for pills generally. I have used it in compounding prescriptions for the last three years, and now am confident of its superior properties, and feel safe to recommend its use by every pharmacist whenever it is applicable. I prefer to use it without any intermixture, for it answers all purposes and is more convenient to use; being a liquid, it can be dropped from a vial, which is done with greater rapidity, accuracy and cleanliness than if combined with starch or tragacanth, which combinations being semi-fluids would have to be used with a spatula, and if the requisite quantity be known, would have to be weighed. Syrup of acacia is most frequently used, over which glycerin has two important advantages. Pills made with syrup of acacia are all larger, and, if kept for a while, become very hard, while

those made with glycerin never become perfectly hard, although they are firm and retain their shape, and, when held between the fingers for a while, and worked, they become very pliable. The amount of syrup of acacia necessary is invariably larger than that of glycerin, as will be seen by the following formulas ; though trifling in some, the difference is sufficient to show that more syrup is required :

R Acid. tannici, gr. xvi Glycerinæ, gtt. iii (or syrup. acaciæ, gtt. iv) M. ft. pil., No. viii.	R Acid tannici, gr. xv Pulv. opii, gr. iii Glycerinæ, gtt. ii (or syrupi acaciæ, gtt. v) M. ft. pil., No. v.
R Pulv. opii, gr. v Pulv. camphoræ, gr. x Acid. tannici, gr. xxv Glycerinæ, gtt. v (or syrup. acaciæ, gtt. x) M. ft. pil., No. x.	R Pulv. opii, gr. viii Pulv. plumbi acet., gr. xl Glycerinæ, gtt. i (or syrup. acaciæ, gtt. ii) M. ft. pil., No. xvi.
R Aloes socot., Ferri sulph. exsic., aa gr. xii Glycerinæ (containing 10 per cent. of alcohol) gtt. ii (or syrup. acaciæ, gtt. vi)	

If glycerin alone is used with these substances, the mass will be apparently adhesive, but upon rolling, it will crumble, and cannot be formed into pills ; this difficulty is overcome by the small quantity of alcohol.

R Quiniæ sulph. gr. xxiv Ext. colocynth. co., gr. xviii Pulv. capsici, gr. xii Glycerinæ, gtt. v (or syr. acac., gtt. xii) M. ft. pil., No. xxiv.

The quantity of glycerin in this formula seems insufficient, but upon working with considerable pressure, it will be found to be just enough to form a very good mass.

R Quiniæ sulph., gr. xxiv Pulv. capsici, gr. xviii Glycerinæ, gtt. xii (or syr. acac., gtt. xii)
--

The quantity of glycerin required in this one seems quite large when compared with the one just before it, which is due to the absence of an adhesive substance ; for if two grains of powdered acacia be added, only eight drops are required.

R

Quinæ sulph.,	.	.	.	.	gr. xxx
Ferri. sulph. exsic.,	.	.	.	.	gr. xv
Strychniæ sulph ,	.	.	.	.	gr. i
Glycerinæ,	.	.	.	gtt. xii (or syr. acac., gtt. xv)	

M. ft. pil., No. xxx.

First rub the sulph. strychnia with a drop of water, add the other ingredients and mix the whole thoroughly together ; then add the glycerin, and triturate briskly until an even mass is formed, which divide into pills as quickly as possible. When done slowly, the mass becomes very brittle, and cannot be rolled out. In the above formula I first noticed the great advantage of knowing the exact quantity of this excipient for forming a mass, for which purpose eighteen drops may be added on a slow operation.

I have a list of formulas similar to the above always within reach at the dispensing counter, to which I can refer to ascertain the amount of glycerin necessary to form a mass, and also write the amount used on the prescription. The glycerin is best dropped by means of a glass tube drawn out at one end to an aperture of $\frac{1}{8}$ inch (or by means of the apparatus figured on page 99 of this volume).

EFFERVESCENT PREPARATION OF SODIUM TARTRATE.

BY HENRY T. HAYHURST, PH.G.

(*From an Inaugural Essay.*)

Within a few years past, an effervescing solution of sodium tartrate¹ has been slowly gaining confidence among physicians as an active cathartic and purge, superior to solution of magnesium citrate, among the people as a cooling beverage and agreeable cathartic, and among pharmacists as an elegant, permanent and profitable preparation. Its superiority over solution of magnesium citrate lies principally in the following qualities : It does not debilitate the bowels, and leave them in a weakened condition. It does not produce tenesmus, and therefore can be used with much less pain, as a purge, where hemorrhoids are

¹ See "American Journal of Pharmacy," 1873, p. 289.

present, than the magnesia solution. It is a permanent solution, and does not precipitate nor become cloudy, after a few days, as the magnesia solution frequently does. It is as palatable and pharmaceutically elegant as the magnesia solution, superior to it in medicinal value, and of much more profit to the pharmacist in manufacturing.

The formula which I have ascertained to give the most stable product and gratifying results is the following, viz :

Take of sodium carbonate,	3i 3ii
acid tartaric, in crystals,	3vi
oil of lemon,	gtt. iii
simple syrup,	f3iss
pure water,	q. s. ft. f3xii

The operation is as follows : reduce the sodium carbonate to powder, rub the oil of lemon intimately with it, and then add water sufficient to dissolve ; to this solution add five drachms of the tartaric acid, and stir occasionally till the acid is dissolved. Filter this solution to remove any impurities which may be present, or any cloudiness resulting from the introduction of the oil of lemon. To this filtrate add the syrup, agitate thoroughly, then add one drachm of tartaric acid (the remaining amount), cork and tie immediately to preserve the carbonic acid gas ; finally, agitate the contents of the bottle occasionally till the acid is all dissolved, and keep in a cool place cork downwards.

The reasons for using the acid in crystals for producing the tartrate, are these : The commercial powdered acid usually contains impurities, and sometimes adulterations, not present in the crystals ; to powder them previously to adding to the alkaline solution would be an unnecessary occupation ; finally the reaction is performed much slower and more regularly than where the powdered acid is used, an object, I think, greatly to be desired in processes evolving much carbonic acid gas. The last portion of the acid could be added by dissolving it first in the syrup and adding this solution, but in doing this the reaction is severe and instantaneous, so that much gas is often lost, while with the crystals the reaction is moderate, and sufficient time is given for inserting the cork, and for the gas to dissolve in the liquid.

Prepared in this manner, effervescing solution of sodium tartrate is a very agreeable beverage, and can be preserved unimpaired for most any length of time, samples having been kept through the hot months uninjured.

I have found such a wide difference in samples of sodium carbonate,

obtained from different establishments, in regard to purity, efflorescence and amount of water of crystallization, that I have purified and recrystallized this salt, much to my satisfaction, and it will fully repay pharmacists to adopt the following plan :

Dissolve the large crystals of common sal soda in pure water, allow all the insoluble impurities to subside, filter this solution and evaporate at a moderate heat till a pellicle forms over the surface of the liquid, and set aside for two or three days to crystallize. A small proportion of mother liquor remains, which, if sufficiently pure, may be still farther evaporated and crystallized, if desired. These crystals should now be dried on a linen strainer in a moderately warm air-chamber, much care being necessary in this operation, as the crystals effloresce readily in the atmosphere, and too much heat will easily liquify the salt again. This process yields beautiful, clear, oblique-rhombic, prismatic crystals, which should be preserved in well-stopped jars. It may contain some sodium chloride and sulphate, which, however, if in minute quantity only, do not detract from its medicinal value.

An effervescing granular salt of sodium tartrate may be formed by heating, on a sand bath, anhydrous sodium carbonate and pure powdered tartaric acid, in the proportion of three parts of the alkali to four and a quarter of the acid. Care must be taken to do this in a vessel not affected, chemically, by tartaric acid, and to keep the chemicals well stirred and scraped up from the bottom, or they will become yellow and carbonized. This gives an agreeable, slightly acid salt, very soluble in water, which solution effervesces briskly, and forms a convenient and pleasant cathartic and cooling drink. This preparation keeps well and does not attract moisture, as do many effervescing granular salts.

For a cooling drink the solution may be taken in tablespoonful doses hourly, as a mild cathartic one half a bottleful and for a brisk purge a whole bottleful. The granular salt may be taken in teaspoonful or tablespoonful doses, dissolved in sweetened water.

THE EFFECT OF LIGHT ON SYRUP OF THE IODIDE OF IRON.

BY CLEMMONS FARRISH, PH.G.

My attention was called, in making syrup iodide of iron, U. S. P., to a change occurring in the same lot under different circumstances. The syrup was made in accordance with the official process, care

being taken to follow out minutely the "Pharmacopœia" directions as to temperature, &c. The result convinced me that the effect of light on the preparation has little or nothing to do with the chemical change resulting in the discoloration so often seen in this syrup, but is the result of atmospheric change in the bottle, caused by careless stopping or defective corks.

From the syrup six one-ounce vials were filled; three of these were corked; three were glass-stoppered vials, in one of which the stopper was coated with paraffin. The syrup in two of the corked bottles retained the desired appearance. The portion in the glass-stoppered vials met with a change in one instance; the stopper coated with paraffin and another fitting securely, remaining unchanged. These bottles were all placed in a window, exposed during the greater part of the day more or less directly to the sun's rays, remaining in this state for about one month.

I have found that the addition of either phosphoric or citric acid, as suggested by Mr. Thos. B. Groves ("Am. Jour. Phar.," 1868, page 265), to be of great benefit in preserving the syrup from atmospheric action, resulting in altered properties and unsightly appearance.

Philadelphia, March 25, 1876.

NOTE BY THE EDITOR.—That the discoloration of syrup of ferrous iodide is due to the oxidizing influence of the atmosphere, and not to light, has been repeatedly discussed in this Journal since 1854.

TINCTURA FERRI CHLORIDI.

BY ISAAC R. DILLER, PH.G.

(*From an Inaugural Essay.*)

The specific gravity of this tincture is .990, and each fluidounce should yield, when treated with ammonia water in excess, precipitate of ferric oxide, weighing, after washing, drying and igniting, 28.8 grains. Each fluidounce should also contain 39.5 grains of anhydrous hydrochloric acid. It should give no dark coloration on addition of a crystal of ferrous sulphate and sulphuric acid (absence of nitric acid), and no blue precipitate with potassic ferridcyanide (absence of ferrous salt). To see how near the tinctures kept in the shops might coincide with these figures in regard to amount of ferric oxide and anhydrous acid contained in them, and also their action with the official tests given

to ascertain their freedom from or the presence of the various impurities to which it is most liable, several samples, from some of the leading pharmacists of this city, were examined, with the following results :

No. of Sample	Amount of Ferric Oxide to f $\frac{3}{4}$ i.	Anhydrous Hydrochloric Acid to f $\frac{3}{4}$ i.	Nitric Acid.	Ferrous Oxide.	Precipitate formed on standing.
1	22.6 grs.	35.2 grs.	Absent	Absent	None
2	27.4 "	40.3 "	Present	"	Slight
3	28.7 "	35.7 "	Absent	"	None
4	26.9 "	33.8 "	"	"	"
5	28.9 "	44.8 "	"	Trace	"
6	17.5 "	30.1 "	"	Considerable	Slight
7	32.2 "	37.0 "	Trace	Absent	None
8	30.7 "	46.3 "	"	"	Considerable
9	27.9 "	35.4 "	"	"	None
10	23.4 "	34.9 "	Absent	"	"

From the above table it will be seen that the samples examined do not vary very greatly in regard to ferric strength, except in one case, while in two samples the ferric strength exceeded the official standard. The difference in the color of the samples was quite noticeable, varying from pale lemon to rich brownish-orange, the depth of shade varying with the proportion of the iron and the amount of acid. According to the present process, there is no excuse for any great deficiency in strength, as by further addition of the liquor it can readily be brought up to the standard, if from any cause the liquor should be wanting in that direction.

A SINGULAR REACTION.

BY JOSEPH P. REMINGTON, PH.G.

(Read at the Pharmaceutical Meeting, April 18th.)

The following prescription was sent to Prof. J. M. Maisch by Jos. W. Hall, of Nashville, Tenn., who states in his letter that he noticed a reaction of a very singular nature take place when the various ingredients were mixed together; when first prepared the color being a dark-red, but changing in a few hours to a beautiful dark-green. It is as follows:

R		
	Syrup. pruni virg.,	f℥ii
	Syrup. tolu.,	
	Syrup. scillæ,	aa f℥i
	Tinct. lobeliæ,	
	Spt. æther. nitrosi,	aa f℥ii
	Morphiæ sulph.,	gr. i
	M. ft. solut. Sig., a teaspoonful.	

The writer was requested to look into the subject, and this was done with considerable interest as one point after another was developed.

1st. The prescription was compounded as given above, when the effect of the change in color was distinctly observed, as noticed by Mr. Hall.

2d. The various ingredients were put together without the syrup of wild cherry. No change in color was discovered on standing twenty-four hours.

3d. All of the ingredients were mixed together, leaving out syrup of tolu. The change in color takes place on standing; the mixture darkens and assumes a green tint.

4th. In this, syrup of squill was omitted—all of the other ingredients combined. The liquid becomes darker red, but does not change to green.

5th. Tincture of lobelia was left out in this experiment. The change took place readily, the mixture becoming quite as green as in No. 1.

6th. All of the ingredients were mixed together except the spirit of nitrous ether. The reaction did not take place—but little change was noticed.

7th. Sulphate of morphia was omitted. The change in this case very decided. The mixture assumes a dark green color.

These results pointed to the fact that syrup of wild-cherry, spirit of nitrous ether and syrup of squill were alone concerned in the reaction, with little if any interference on the part of tincture of lobelia.

Spirit of nitrous ether and syrup of wild-cherry, when mixed together, acquired a greater depth of color, but did not become green. When syrup of squill was added, however, the green tint began to develop, and when allowed to stand as long as in No. 1, the shade was nearly the same.

From the peculiar coloration and its method of development, the

presence of iron in minute quantity was suspected in the syrup of squill and spirit of nitrous ether; and, on applying the tests for this metal to the two preparations, as obtained from various sources, distinct evidences of a *minute* quantity of iron were obtained.

In order to show with what ease this contamination (it can hardly be called an adulteration) creeps into the preparation of spirit of nitrous ether, a small quantity was placed in a glass vessel and stirred for a few moments with an iron spatula, when a drop or two of solution of ferrocyanide of potassium was added—a characteristic blue precipitate resulted. The explanation is simple, sufficient acid being usually present in spirit of nitrous ether to act upon the metal and form a soluble salt. When a partly-worn tinned iron measure is used by the manufacturer or wholesale dealer in measuring this preparation (as is often the case), a trace of this metal would surely be left in it, particularly if the liquid was allowed to stand in the measure any time. Commercial acetic acid, and even some of the finer grades, were found to contain slight traces of iron; and hence, in syrup of squill, we have the metal present in minute quantity.

Now, why does the green coloration appear? Wild-cherry bark contains tannic and gallic acid, and these give, with small quantities of an iron salt, a dark-green coloration in the presence of an acid like acetic.

In order to show that the tannic and gallic acids were concerned in producing the color, an infusion of wild-cherry was prepared carefully, by the U. S. P. formula, to which was added spirit of nitrous ether and syrup of squill in the same proportion as in the prescription. The same play of colors took place; first, a deepening of the red, then gradually changing, until the dark-green appeared. The subsequent addition of a trace of iron still further deepened the coloration.

Part of the same infusion was deprived of tannic acid by shaking it with hydrated sesquioxide of iron, until a small portion of the filtrate failed to give a coloration with a weak solution of an iron salt. When to this infusion the same proportion of spirit of nitrous ether and syrup of squill was added, as in the prescription, no change in color was observed, even after standing.

The presence of a slight excess of acid favors the formation of the green coloration; and when an alkaline solution is added, the green coloration disappears, and a slight precipitation takes place.

The examination of this subject furnishes another illustration of the necessity for the most scrupulous care, not only in making preparations, but in guarding them from contamination after they are made. Although in this particular case, practically, no harm could possibly result from the presence of the trace of iron, yet we see in it a cause for annoyance, and the prescription would very likely be returned by the patient with suspicions of an error in compounding.

UVA URSI AND SPIRIT OF NITRE.

BY M. S. BIDWELL, ELMIRA, N. Y.

(*Read at the Pharmaceutical Meeting April 18.*)

Two communications have recently appeared in the "Druggists' Circular," asserting that sweet spirit of nitre and fluid extract of uva ursi would form, in some cases, an explosive mixture. Other ingredients were mentioned—syrup in the one case and fluid extract of buchu in the other, but the two former were supposed to be the dangerous agents. As every pharmacist has frequent occasion to mix these ingredients, and no disturbance has ever before been made public, I was skeptical as to the reality of the startling phenomenon, and paid no attention to the first statement, but on the appearance of the second, proceeded to the following simple experiments, which any one can verify:

1. Fluid extract of uva ursi, of my own make, about twenty months old; sweet spirit of nitre, also of my own make, about a month old, and kept standing on crystals of potassium bicarbonate, to prevent any acidity. Two drachms of each were mixed, with no perceptible action of any kind.

2. Fluid extract, made by Squibb, several years old; spirit of nitre, as above, and result the same.

3. To each of these mixtures was added about one drachm of dilute nitric acid, U. S. P.; a decided effervescence at once occurred, the surface of the liquid being nearly covered with minute bubbles, with a decidedly nitrous odor. The reaction continued perhaps ten minutes, and would very likely have been more energetic in a larger quantity of the materials.

It seems fair to conclude, therefore, that the liquids mentioned will not produce any disturbance if the spirit of nitre is in good condition;

but that if it is old and strongly acid, effervescence will be produced which, if the ingredients are in considerable quantity and in a closed bottle, might amount to an explosion. As to the chemical reaction, I can offer no suggestion.

SIMPLE CERATE AND OINTMENTS IN GENERAL.

BY HANS M. WILDER.

The pharmacopœia (and all works on pharmacy) tells us, after having melted and strained (if necessary) the cerate, to "stir constantly until cool."

This method serves a good purpose for simple cerate, and may be used for nearly all ointments.

For some time past I have been using a method recommended to me, years ago, by an old apothecary (and said to be employed by perfumers in making pomatum), which consists in letting the melted mass cool down undisturbed, and, when *perfectly cold*, with a pestle gradually work your way from the top (by rubbing) down and through the mass. The ointment treated in this way is softer, never gets hard on its surface, and, as asserted by physicians, is more quickly absorbed by the skin than when made by "stirring constantly till cool;" which injunction, by the way, seldom is complied with.

There will, of course, be raised one great objection to this method; with lots of more than a couple of pounds it becomes rather a hard task to move the pestle round at last.

EXTRACTUM PRUNI VIRGINIANÆ FLUIDUM.

BY ISAAC W. SMITH, PH.G.

Having experienced great difficulty in obtaining a satisfactory fluid extract of wild cherry bark, it occurred to me that a modification of the officinal process might with advantage be adopted, to obviate the difficulty, and herewith I present the following formula, which yields an extract superior in its sensible properties to that of the "Pharmacopœia":

Take of Wild cherry bark, in coarse powder,	64 oz. (troy)
Water,	2 pints
Glycerin,	1 pint
Alcohol, 95 per cent.,	sufficient quantity
Sweet almonds, blanched,	8 oz. (av.)

Mix glycerin and water, moisten the bark with 2 pints of the mixture, allow it to stand in a closely covered vessel for four days, then pack in a conical glass percolator and pour on the remainder of the mixture; when this has disappeared from the surface, gradually pour on the alcohol until 48 fluidounces have been obtained, and set this portion aside. Continue the percolation with the alcohol until 80 fluidounces more have been obtained. Evaporate this by means of a water-bath to 16 fluidounces; allow it to cool. The almonds having been reduced to a smooth paste, mix this last portion with them and add to the first portion reserved, in a closely stopped bottle, and agitate the whole together. Allow it to remain in contact for 48 hours, with frequent agitation; then prepare some paper pulp, and place in a filter in a glass funnel, adding the mixture gradually to the pulp, stirring upon each addition, so as to get the mixture thoroughly incorporated with the pulp, observing to keep the funnel closely covered during the process—the result being an extract of a brilliant reddish-brown color, possessing all the virtues of the bark in a very marked degree.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Combination of sulphate of quinia with phenol.—Mr. S. Contot has noticed, some time ago (Lyon méd. XIX. 480 and 666), the existence of such a compound, and now gives a fuller account, from which we take the following:

A solution of carbolic acid, in an equal weight of 80 to 93 per cent. alcohol, is added to a saturated alcoholic solution of quinia sulphate; in a short time the new compound will commence to crystallize in wart-like masses. It is also obtained by adding to an alcoholic solution of carbolic acid and quinia some sulphuric acid. The names of *carbolated (phenated) sulphate of quinia*, or *sulphate of phenol-quinia* are suggested to distinguish it from the sulpho-phenate of quinia. It crystallizes from water in star-like groups composed of short needles, has neither the odor nor the caustic properties of phenol, after having been washed with ether and recrystallized, and by the action of chlorine water and ammonia, barium chloride, and concentrated nitric acid, followed by ammonia, indicates the presence of quinia, sulphuric acid and phenol, in the latter case by the color of ammonium picrate; but neither hypochlorites, bromine or hypobromites indicate the pres-

ence of phenol, nor is the quinia salt affected by ammonia, in certain proportions. The salt, which possesses considerable antiseptic properties, has the formula $C_{20}H_{24}N_2O_2, SO_3, C_{20}H_{24}N_2O_2, C_6H_6O + 7H_2O$, the water is given off at a temperature of $150^\circ C$ ($302^\circ F$). It is more soluble in water than quinia sulphate, but almost insoluble therein in the presence of free phenol; sulphuric acid renders the salt very soluble without separating phenol, but diminishes the fluorescence considerably.

The insolubility of sulphate of phenol-quinia may serve to separate this alkaloid from cinchonia, the sulphate of which does not produce an insoluble compound with carbolic acid.—*L'Union Phar.*, 1876, pp. 75-78.

To color arsenic for ordinary sales as a rat's bane, Grimaud of Poitiers proposes to mix 98 parts of arsenious acid, and one part each of ferrous sulphate and potassium ferrocyanide, all in the state of fine powder. The mixture assumes a light blue color and is said to possess an odor of bitter almonds, without interfering with the poisonous properties of the arsenic.—*Bull. Comm. de l'Union Phar.*, 1876, 16.

Fowler's Solution.—Having observed a gradual deposition of arsenious acid, Mr. Ch. Ménière kept 100 grams of this preparation for three years, and then collected from it 15 centigrams of arsenious acid, which had been deposited in the form of needles upon the separated volatile oil.—*Rép. de Phar.*, 1876, 65.

Quinia in Hypodermic Injections.—S. Limousin has found that the acid hydrobromate of quinia has the composition $C_{20}H_{24}H_2O_2, 2HBr, 3H_2O$, and is soluble in 9 parts of water at $15^\circ C$ ($59^\circ F$). The neutral salt $C_{20}H_{24}H_2O_2, HBr, H_2O$ is less soluble than the ordinary quinia sulphate. The corresponding sulphovates, however, which the author proposed for use in hypodermic injections in 1873, contain about the same amount of quinia as the corresponding hydrobromates (75 to 76 per cent. quinia in the neutral, and 56 to 60 per cent. in the acid salt); but they are more soluble than the latter, which, however, are preferable in all such cases, where the effects of bromine are likewise needed.—*Ibid.*, 113, 115.

Salicylic Acid in Solutions for Hypodermic Injections.—S. Limousin has observed that a solution of 0.20 grams of morphia hydrochlorate in 10 grams of distilled water, was spoiled in three weeks with the separation

of numerous crystals and slimy flocks, while a solution of the same strength remained clear and limpid after the addition of 2 centigrams of salicylic acid, which the author regards as superior to the various agents previously recommended for the same purpose. Salicylate of morphia, requiring about 150 parts of water for solution, is not adapted for hypodermic injections.—*Ibid.*, 129.

Sodium Copaivate is prepared according, to L. Géza, by distilling copaiva balsam with water to remove the volatile oil and purifying the resulting resin by repeated solution in rectified petroleum and strong alcohol. The crystallized copaivic acid is then combined with soda. This compound has been successfully tried by Dr. Zlamál, in the form of pills made by using 2 parts of sodium copaivate with 1 part of dextrin and aromatising with oil of sandal wood.—*Phar. Post.*, 1876, No. 6.

Chlorinated Lime and Glycerin.—In preparing an ointment composed of 10 grams of the former and 30 grams of the latter, Schiedmeyr triturated the dry chlorinated lime with about its own weight of glycerin, when heat and a yellowish-brown gas, having a penetrating, but not disagreeable odor, was evolved, and a hard, brown mass was left in the mortar. If all the glycerin was added at once, a similar effect was produced, except that the mass had the consistency of an ointment. By using moist chlorinated lime, the brown compound is not formed, and the ointment retains the odor of chlorine. Chlorinated lime should therefore be first triturated with water before the glycerin is added.—*Zeitschr. Oest. Apoth. Ver.*, 1876, No. 9.

Syrupus ferri lactophosphatis.—C. Jehl dissolves 50 grams of ferrous sulphate and 150 grams sodium phosphate, each separately, in 750 grams of water, mixes the solutions, washes the precipitate rapidly, and dissolves it in 60 grams of concentrated lactic acid; sufficient water is now added to make the weight of the solution 1,882 grams, and the syrup made with the addition of 3,586 grams of sugar. The syrup may be flavored with 50 grams of spirit of lemon. Twenty grams of the syrup contain 0.1 gram of ferrous phosphate.

Syrupus ferri et calcii lactophosphatis.—The same author prepares a solution of ferrous phosphate from 9.25 grams of ferrous sulphate and 27.75 grams of phosphate of sodium, in 11 grams of concentrated lactic acid; also, a solution of 13.3 grams of phosphate of calcium in 24 grams of the lactic acid and 100 of water. The two solutions are

mixed, sufficient water added to make 388 grams, and the syrup finished by the addition of 625 grams of sugar and 15 grs. of spirit of lemon. Twenty grams of the syrup contain 0.2 phosphate of calcium and 0.1 of ferrous phosphate.—*Schweiz. Woch. f. Phar.*, 1876, No. 7.

Indelible Ink.—200 grams tartaric acid are dissolved in 1 litre of hot water; in one-half of the solution dissolve 100 grams of oily anilin; add the other half, and then 100 grams of chlorate of potassium. Allow the solution to cool and subside until next day; filter from the bitartrate, and bring the liquid to the density of 7° B. Thicken sufficiently with gum arabic, and add to each litre 20 grams of copper sulphate, dissolved in little water. This ink may be at once used for printing muslin and other fabrics, upon which the black color will be perfectly developed by bleaching liquids. Chlorate of copper is also used for writing upon zinc used for signs and labels exposed to the weather.—*Ibid.*, No. 10.

Liquid Glue.—One part of phosphoric acid, specific gravity 1.120, diluted with 2 parts of water, is nearly neutralized with ammonium carbonate, one part of water added, and then, in a porcelain vessel, sufficient glue dissolved in the liquid to obtain a syrupy consistence. It must be kept in well-closed bottles. The addition of glycerin or sugar would cause the glue to gelatinize.—*Chem. Centralbl.*, 1876, No. 6.

To prevent the cracking of glue by heat or extreme dryness, the addition to the solution of some calcium chloride is recommended, which retains sufficient moisture to obviate this inconvenience. Thus prepared, glue can also be used upon glass and metallic surfaces.—*Ibid.*, No. 9.

Waterproof varnish for paper, &c., is obtained by precipitating a solution of tallow or resin soap by aluminum, iron or copper sulphate, and dissolving the precipitate in a liquid hydrocarbon, or in carbon bisulphide.—*Ibid.*, No. 8.

The estimation of tannin, by Carpane's method, has been modified by J. Barbieri as follows, whereby correct results are obtained: The tannin solution is precipitated by an excess of an ammoniacal solution of zinc acetate, the entire mixture heated to boiling, evaporated to two thirds, and filtered after cooling; the precipitate is dissolved in diluted sulphuric acid, filtered, if necessary, and then titrated with solution of potassium permanganate, which has been previously titrated with commercial tannin. The results are said to be exact.—*Apoth. Zeitung*, 1876, No. 8, from *Ber. d. d. Chem. Ges.*

SELECTIONS FROM THE DANISH JOURNALS.

BY HANS M. WILDER.

Telegraphy by means of Tuning-Forks.—P. la Cour (Denmark) has invented a new telegraph apparatus (June, 1874),¹ which bids fair to play an important rôle at no distant future. It is based on the fact that when a tuning-fork, by its vibrations, closes and opens an electrical circuit, another tuning-fork, connected with it by the wire—provided it have the same pitch—will be made to vibrate. Any number of differently pitched tuning-forks may be connected with others by the same single wire, and only the corresponding ones (the isochronous) can be made to vibrate.

The practicability of the above method of telegraphing was demonstrated on the wire between Copenhagen and Fredericia (390 kilometers, about 250 miles). (The description of the instrument, the advantages accruing from its use and the detailed experiments will be found in "Ann. de Chim. et de Phys.," 1875, p. 284).—*Arch. for Ph.*, 1875, p. 466.

A New Kind of Spontaneous Combustion.—"Pharm. Centralh.," 1875, No. 25, reports a case of spontaneous combustion arising in a box of chipped logwood, which probably had been packed in a moist state.—*Ibid.*, p. 480.

Arsenic.—Prof. Binz, in Bonn, calls, again, attention to Bettendorff's test (see "Amer. Jour. Phar.," 1871 (xliii), p. 222) for arsenic, as the easiest for the physician. Put a piece of the suspected substance in a test-tube, pour over it concentrated muriatic acid, add a few crystals of protochloride of tin, and heat; arsenic, if present, will be reduced, and thrown down as a dark-brown powder.—*Ibid.*, p. 483.

Caoutchouc in Affections of the Lungs.—Electuary of caoutchouc has again been recommended in phthisis, etc., by Drs. Varick and Calver. Dissolve, by maceration, 30 grams finely cut caoutchouc in 60 grams oil of turpentine; strain, and mix $7\frac{1}{2}$ grams with 45 grams of sugar and 75 grams of honey. One teaspoonful of this electuary contains about 0.12 gram of caoutchouc. It is said to prevent night-sweats, blood-spitting and emaciation.—*Ibid.*, p. 495, from *Pharm. Centralh.*, 1875, No. 41.

Infants' Food.—Dr. H. Muller has examined into the quality of the different kinds of food for infants, and came to the following results: *Liebig's food* is somewhat difficult and tedious of preparation, so that, as a rule, the soup is seldom properly made. The different modifications that exist are much more easy to use, but they do not keep as well, and do not taste as agreeable as the original food. One serious objection is found to Liebig's food—its exclusive use predisposes children to rachitis, since it does not contain sufficient *bone food*.

Nestlé's mother's milk and (still more, a modification of it) Faust and Schuster's *Göttingen infant meal*, Dr. M. considers the best substitute for mother's milk. It contains in 100 parts: 11.51 protein substances, 79.61 carbohydrates, 1.80 inorganic

¹ The same or a similar apparatus has recently been on exhibition at the Franklin Institute, in Philadelphia.—EDITOR AMER. JOUR. PHAR.

salts, 6.73 water (von Uslar and Polstorff). The inorganic salts contain in 100 parts: 31.70 phosphoric acid, 29.78 potash (Freitag).—*Ibid.*, 1876, p. 12.

Restoration of Faded Writing.—Moisten the paper a little with water, and brush over it a solution of sulphydric ammonia. Since most inks contain iron, it is easy to understand that there will be formed sulphide of iron, which is black.—*Ibid.*, p. 22, from *Industrie-Bl.*

Arsenical Poisoning.—Scoloseboff has found that, both in slow and rapid poisoning, the arsenic accumulates chiefly in the brain, spinal marrow and the nerves. On the contrary, comparatively little will be found in the liver and muscles generally. A dog had, in thirty-four days, taken, in increasing doses, from 5 mgrms. to 15 cgrms. arsenious acid. On examination, was found:

In 100 grams,	muscles,	0.00015 grams.
"	liver,	0.00271 "
"	brain,	0.00885 "
"	spinal marrow,	0.00932 "

or 1 : 10.8 : 36.5 : 37.3.—*Ibid.*, p. 24, from *Pharm. Centralh.*, 1875, No. 45.

Dita Bark.—("Am. Jour. Phar.," 1873 (xlv), p. 316) Jobst and Hesse have examined this bark (from *Echites scholaris*, L.; *Alstonia scholaris*, Brown), and reported their results at some length in "Ann. d. Ch. und Ph.," vol. 178. After a description of it, they mention ditaïn obtained by Gruppe in Manilla, and then detail their chemical investigation. The following new alkaloids, acids, etc., are found by them: Ditamin, echicautchin, echicerin, echicerinic acid, echitein, echiretin.—*Ibid.*, p. 27, from *Pharm. Centralh.*, 1875, No. 49.

Action of Borax as an Antiseptic.—Dumas and Schnetzler state that they have found that borax coagulates the protoplasm of the cells, and in this way kills lower organisms; it becomes, then, easy to understand how it can act as an antiseptic.—*Ibid.*, p. 30, from *Ann. d. Ch. et d. Phys.*, 1875, p. 543.

Pharmacy in Denmark.—The Royal Board of Health, in reply to numerous petitions about permission to start new pharmacies, expresses its conviction that the public will undoubtedly be benefitted by competition even of drug stores, under certain restrictions, and with due regard to existing regulations about surveillance, etc.

It has been resolved to revise the existing poison-law, particularly with respect to the manifold uses active poisons of late years have been put to, both in manufactures and in the household.—*Ibid.*, p. 39, etc.

CENTENNIAL EXHIBITION !

The Philadelphia College of Pharmacy will open their rooms for the convenience of visitors on the 8th of May. An Actuary, speaking English, French and German will be in attendance, between the hours of 9 A. M. and 6 P. M., to give such information as may be desirable to strangers visiting Philadelphia.

COMMITTEE ON RECEPTION.

MINUTES OF THE COLLEGE.

PHILADELPHIA, March 27th, 1876.

The annual meeting of the Philadelphia College of Pharmacy was held this day at the Hall of the College, No. 145 North Tenth street.

The President, Dillwyn Parrish, occupied the chair, and twenty members were present.

The minutes of the meeting of December, 1875, were read and, on motion, adopted.

The minutes of the Board of Trustees since the College meeting in December were also read by the Secretary of the Board, William C. Bakes, and, on motion, adopted.

The annual report of the Librarian was read by him, and, on motion, accepted.

The Librarian respectfully reports that since last report he has bound the theses of the class that was graduated in the Spring of 1875.

There are now fifty volumes of these in the Library.

During the past year the arrangement of the entire Library has been completed, each book ticketed and numbered, and a new registration of the books has been made; the books are arranged in five classes, to wit:

	Vols.
Class A—Encyclopædias, Public Documents and Reports....	344
Class B—Chemistry.....	220
Class C—Pharmacopœias, Dispensatories, Formularies, Materia Medica, Pharmacy, Botany.....	255
Class D—Miscellaneous.....	313
Class E and F—Serial publications.....	1131

There have been added during the past year about sixty volumes, many of them being exchanges made with the "*Journal of Pharmacy*," and of a character suitable for our Library, while in other instances a number of volumes have been purchased to complete sets which were in part already on our shelves.

Our Library now comprises about twenty-three hundred volumes, not counting duplicates; several works we have in a number of editions, but the committee would be glad if any of the members can furnish some of the older editions of the United States Dispensatory, there being only three of the thirteen editions issued now catalogued by us.

The arrangement alluded to in the early part of this report will enable any one to ascertain whether any treatise upon a particular subject is in our Library with but little trouble, and it is hoped that the labor which has been bestowed upon the Library will be found conducive to the advantage of those of our members who may require to consult the volumes.

THOS. S. WIEGAND, *Librarian*.

March 27, 1876.

Wm. B. Webb alluded to the labors of the Librarian, and recognized the value of his services in that department. He hoped that gentlemen would express their appreciation of the work performed. Several members joined in this opinion, and a general recognition of the value of his services was expressed.

Professor Remington, Curator, offered the following report, which was read and accepted:

The Curator would report progress in the work of refitting and adding to the cabinet. Although much still remains to be accomplished, it is confidently hoped that in a few months it will be in a presentable condition.

The thanks of the College are due to Powers & Weightman for their liberal offer to refit the chemical cases, and to Hance Brothers & White for their gift of many valuable specimens of indigenous drugs, and to Messrs. Webber, Taylor and Holden, members of the class of 1876, for their assistance in arranging the specimens in the bottles.

JOSEPH P. REMINGTON, *Curator*.

March 27, 1876.

The Committee on Publication, through Professor Maisch, presented the following report of their labors during the past year, showing a very satisfactory result. The report was accepted.

To the Philadelphia College of Pharmacy:

The Publishing Committee respectfully report that they have attended to the various duties incumbent upon them, as will be seen from the annexed reports. From the Editor's report it will be seen that the number of original essays published in the "Journal" during the twelve months was ninety-six, of which number ten were abstracts from theses. The number of original papers considerably exceeds that of former years, and the committee bespeak for the "Journal" a continuance of this gratifying interest on the part of its readers, and more particularly of the members of this College. At the Pharmaceutical Meetings twenty papers were read, and the request made last year is herewith renewed, that the members not only endeavor to make it convenient to attend these meetings, but likewise that, if possible, they give notice beforehand to the Registrar of such subjects which they may intend to bring forward for discussion. Such previously given notice has invariably resulted in a full attendance and participation in the discussions.

The financial affairs of the "Journal" may be called satisfactory. For further particulars the committee refer to the Editor's and Business Editor's reports.

HENRY N. RITTENHOUSE, *Chairman Publishing Committee.*

Philadelphia, March 27th, 1876.

The Editor's report to the Publishing Committee was read, and as it gives a general account of the number of original essays which appeared in the "Journal," its publication will be a matter of interest and serve to stimulate members and others to continue their contributions to its pages.

To the Publishing Committee:

The Editor respectfully reports that the "Journal" has been promptly issued every month and that the interest manifested in it by its readers has been considerably in excess of former years, as will be seen by the comparative account given below, and by the fact that several numbers were issued consisting almost exclusively of original matter. The Pharmaceutical Meetings have contributed very essentially to this gratifying result, not less than twenty papers of more or less interest and importance having been contributed to the "Journal" from this source alone. The Editor would urge upon the members of the College to continue their interest in the Pharmaceutical Meetings and the "Journal" by reporting their observations either verbally or preferably in writing, and thereby contribute to the general stock of knowledge. It may safely be expected that during the coming summer ample opportunities for study and observation will be afforded through the International Exposition, and it is to be hoped that this opportunity will not be lost sight of by the members. The invitation extended last year to report to the Registrar the subjects of the papers to be read, in advance of the meetings, has only in a few instances been responded to; it is now renewed in the hope that in the future members will more frequently avail themselves of the opportunity to give notice in advance of the subjects intended for discussion.

During the year closing with the March number, there have been published in the "Journal," exclusive of authors' printed communications, original translations, abstracts and editorials, ninety-six original papers, which is seventeen and twelve papers more than appeared in the "Journal" during the two preceding years. Among these numbers are included abstracts of ten theses, against sixteen and eighteen during the preceding years. The total number of original essays, exclusive of theses, were, therefore, for the year ending March, 1874, sixty-six; March, 1875, sixty-three, and March, 1876, eighty-six. Of the latter number, twenty of which were read at the Pharmaceutical Meetings, sixteen treated of subjects belonging to materia medica, twenty to chemistry, thirty-five to pharmacy and fifteen to subjects of more general interest. Of the ten theses seven were devoted to subjects of materia medica, two to pharmacy and one to chemistry. The total of ninety-six papers were contributed by seventy-two authors, against fifty-two up to March, 1875, and sixty to March, 1874. During the past year, three authors contributed five papers each, two authors three papers each, and eight authors two papers each, the remaining fifty-seven papers having been written by as many contributors. Sixteen of the authors are members of the College and contributed twenty-seven papers.

The amount of original matter which was placed at the Editor's disposal during the past year rendered the condensation of most of the interesting material found in other journals necessary; and if, as is to be hoped, the interest of original contributors in the "Journal" does not slacken during the coming year, there will be much of original matter available; for, as far as can be judged from a hasty examination of the theses presented at the last examination, a larger number than usual appear to be adapted for publication in the form of abstracts.

In this connection it is proper to mention that, aside from the reports of their meetings, two papers have been published after having been read before the New York Alumni Association of the Philadelphia College of Pharmacy, a body composed of graduates of this College residing in the city of New York and vicinity.

JOHN M. MAISCH, *Editor.*

Philadelphia, March 24th, 1876.

The Business Editor's report to the Committee on Publication, detailing all the operations of his department, was read by Mr. Bullock. It is a very satisfactory exhibit, and continues to show the judicious management of Mr. Wolle.

Mr. Bullock further read the report of the Treasurer of the Publishing Committee. It shows a sound financial condition, and exhibits a steady improvement from year to year.

The report was, on motion, accepted.

The chairman of the Committee on the Sinking Fund was rendered by Thos. S. Wiegand, showing a balance in his hands of \$907.94.

Mr. Bullock, on behalf of the Committee on the Centennial, reported subscriptions nearly sufficient to accomplish their purposes, and with a slight effort on the part of those who have not yet contributed, the amount necessary would soon be obtained. It was the intention of the committee to fit up the College generally.

A gentleman, a native of this city, had been engaged by them to attend daily at the College during the Exhibition, who is conversant with the French and German languages.

The committee would request the members to interest themselves, and call at the College and witness the work being performed.

A printed letter from the "National College of Pharmacy," dated Washington, March 22d, 1876, and addressed to this College, was read. This letter treated upon the disagreement which has lately arisen between some colleges of pharmacy in the United States, relative to the conferring of degrees and titles. The matter was commented on by Messrs. Maisch, Bullock and Remington, but as the subject was thought to be one requiring more mature deliberation than could be given to it at this meeting, a motion was made and adopted to refer the letter to the Board of Trustees for their consideration.

George W. Earl, a member of the College, placed at the disposal of the Committee on Centennial Preparations one hundred pounds of white lead, which was, on motion, accepted, and Mr. Earl is entitled to the thanks of this College for the donation.

A letter from William Stahler, of Norristown, Pa., communicating the intelligence of the death of J. Howard McCrea, a member of the College, was read and referred to the Committee on Deceased Members.

The Treasurer reported the name of a member who was five years in arrears to the College; on motion his name was ordered to be stricken from the roll.

The Treasurer further reported that August Hohl had sent in his resignation, which was, on motion, accepted.

Prof. Remington, in a few suitable remarks, presented to the College, from a number of members, a portrait in oil of the late Professor Procter, stating that it was previously the intention to have had a bust prepared, but owing to some difficulties, which finally proved insurmountable, the project was abandoned, and the

portrait was substituted in its stead. He alluded to Mr. Andrew Blair as having assisted in the undertaking.

On motion of Mr. Boring the portrait was accepted, and the thanks of the College were ordered to be tendered to Prof. Remington and those who assisted him in the matter.

Prof. Maisch called the attention of the College to the Annual Meeting of the American Pharmaceutical Association in September next, and suggested the appointment of a committee of five to act in conjunction with the Local Secretary of the Association, Dr. A. W. Miller, in making such arrangements as may be necessary for the accommodation of the association.

The motion was adopted, and the President appointed Messrs. J. M. Maisch, E. M. Boring, Wm. McIntyre, Andrew Blair and Joseph P. Remington the committee. On motion of Mr. Bullock, the committee were authorized to employ such help as they might deem necessary.

Prof. Maisch again appealed to the members present, as well as to those absent, to come forward and help to arrange the Herbarium, which was now in an advanced state of progress. Mr. Mattison moved that Prof. Maisch be empowered to employ such help as he might think proper to complete the undertaking, which motion was adopted.

This being the annual meeting, an election for officers, trustees and standing committees was ordered. Charles Wirgman and Albert P. Prown, acting as tellers, reported the following gentlemen unanimously elected to the various positions enumerated below:

President—Dillwyn Parrish.

First Vice President—Charles Bullock.

Second Vice President—Robert Shoemaker.

Treasurer—Samuel S. Bunting.

Recording Secretary—William J. Jenks.

Corresponding Secretary—Alfred B. Taylor.

Board of Trustees—Robert Bridges, M. D., John M. Maisch, Daniel S. Jones, Thomas S. Wiegand, James T. Shinn, T. Morris Perot, William B. Webb, Joseph P. Remington.

Publication Committee—John M. Maisch, Henry N. Rittenhouse, Thomas S. Wiegand, James T. Shinn, Charles Bullock.

Sinking Fund Committee—Thomas S. Wiegand, T. Morris Perot, James T. Shinn.

Editor—John M. Maisch.

Librarian—Thomas S. Wiegand.

Curator—Joseph P. Remington.

There being no further business to claim the attention of the meeting, then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

MINUTES OF THE PHARMACEUTICAL MEETING.

The seventh regular meeting of the session was held April 18th, 1876, A. P. Brown in the chair. The minutes of the previous meeting were read and approved. Prof. Maisch made the following donations to the library and museum: "Proceedings of the Seventh Annual Meeting of the California Pharmaceutical Society, also of the Third Annual Meeting and Commencement Exercises of the California Col-

lege of Pharmacy, etc." And "The Little Book of German, a High School Primer," by C. C. Schaeffer, late Professor of the German language in the University of Pennsylvania. From Geo. W. Kennedy, Pottsville, "Cylindrical Specimens of Rock Borings from the Pennsylvania Diamond Drill Company." From J. U. Lloyd, Cincinnati, resin of podophyllum,—fluid extract gossypium herbaceum from fresh bark, crystals from prickley ash bark, some roots illustrating a bale of hydrastis canadensis, and carbonate of potassium which had been sold (probably by mistake) for bromide of sodium. In regard to these Mr. Lloyd writes: "The resin exists in podophyllum peltatum, and is distinguished by being soluble in ether, while that prepared by the U. S. P. will but partially dissolve in this menstruum. It is being experimented with to ascertain its value as a medicinal agent.

"The crystalline substance marked from 'prickley ash bark' is a proximate organic substance which exists in considerable amount in the barks of xanthoxylum fraxineum. It has never been experimented with as a medicine that I am aware of. It is tasteless, colorless, insoluble in cold water, *very* slightly soluble in boiling water; somewhat in cold alcohol; quite soluble in boiling alcohol. Nitric acid turns it yellow, and dissolves a small amount, turning yellow. Sulphuric acid dissolves it freely, forming a beautiful transparent deep-red solution; water added to the solution produces a white precipitate; the liquid in which it is suspended is colorless. The precipitate presents the exact properties of the original substance. At 212° F. the sulphuric acid solution decomposes, sulphurous acid being evolved freely and a black precipitate formed. When water is added and the mixture thrown on a filter the filtrate passes colorless. It will not reduce an alkaline solution of sulphate of copper. When boiled with dilute sulphuric acid, and tested for glucose, there is no reaction with the copper solution. It will not form salts with dilute acids. Solution of caustic potassa does not seem to affect it.

"The fluid extract of gossypium is a specimen of 160 bottles I have distributed to practicing physicians in our hospitals and over the country. I trust to be able to learn something definite in regard to the preparation to present in my report to the American Pharmaceutical Association."

"A lot of about 500 lbs. of hydrastis canadensis was recently offered for sale in Cincinnati. Upon examination, it proved to be about half beth root (trillium pendulum); while mixed throughout the entire mass was serpentaria, cypripedium, sanguinaria, may-apple and other substances. The question is: '*Can we ever do away with this loose business?*' Will there ever be a universal demand for prime indigenous botanical medicines? Must those who will furnish good medicinal roots and barks be compelled to compete with traffickers of this description? The above example is but one of many."

Prof. Remington read a paper on "a singular reaction in a prescription" (see page 211). The Professor had continued his experiments, and the opinion expressed at the last meeting was confirmed. The presence of some free acid is necessary, and if neutralized, the color will disappear; the green color is due to the yellow color of the syrup, and to the blue of the tannin and iron reaction.

Prof. Maisch exhibited a sample of belladonna ointment, which, at the house of the patient, had separated into a bright, pale-green lower layer, the upper stratum being of a brownish color. It had, probably, been subjected to changes in temperature.

Prof. Maisch exhibited, from Walter E. Bibby, ammoniac in powder, retained in this condition by admixture with sugar of milk; also mercury one part and sugar of milk two parts, rubbed together in a dry mortar without any further addition. The extinction of the mercury being rapid, and little labor required, this process suggests itself as a convenient way of getting the various preparations of mercury. Mr. Bibby will continue these experiments and report at the next meeting.

Dr. Miller exhibited spermaceti obtained from oil of rose, one fluidounce, purchased as the best oil in the market, having yielded eight grains of the adulterant.

J. T. Farr inquired for a process for keeping powdered camphor. The use of glycerin has recently been recommended, but for large quantities the process of sublimation into a large chamber, as suggested by J. C. Lowd ("Proc. Am. Phar. Asso.", 1871, p. 441), appears to be the best known.

Prof. Remington called attention to the fact that mustard would sometimes fail to act from the skin being insusceptible.

The statements by two writers to the *Drug. Circ.*, reporting the occurrence of an effervescence on mixing spirit of nitre and fluid extract of ura uris, being referred to, Prof. Maisch read a paper on this subject, which he had just received from M. S. Bidwell, Elmira, N. Y. (See page 214.)

Dr. Miller exhibited gold-beater's skin, prepared in such manner as to be opaque; also, hog bladders thoroughly cleansed for druggists' use.

Prof. Remington spoke of a new kind of lint which is prepared by a physician of this city. It is corrugated, thick white paper, strong and elastic, absorbent, and may be made styptic.

On motion, a vote of thanks was given to the contributors of specimens and papers.

WILLIAM MCINTYRE, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

AMERICAN PHARMACEUTICAL ASSOCIATION—The following report has been made by the Committee on the Ebert Prize:

To the President of the American Pharmaceutical Association:

The Committee on the "Ebert Prize" respectfully report that they have examined the papers presented at the last meeting of the Association, and found the majority of them to be creditable to their authors and to the Association in whose "Proceedings" they have been published.

The conditions governing the award, as stipulated by its founder, are such that the majority of the papers offered to the Association, although valuable and instructive, do not come within the scope intended, as competing for the award. A critical examination of the papers resulted in limiting the number to those on phosphoric acid and on pancreatin. Regarding these, the committee would respectfully offer the following remarks:

On phosphoric acid three valuable papers were presented, one of which, by Prof

Markoe, suggests a new process for preparing diluted phosphoric acid by the action of bromine upon phosphorus in the presence of nitric acid. This is an important modification of Pettenkofer's process, proposed in 1866, wherein the oxidation of the phosphorus is effected by the agency of iodine and subsequently water, some nitric acid being finally used to effect the complete oxidation of any phosphorous acid present. While the committee acknowledge the entire safety of the new process, if properly managed, yet they cannot refrain from taking into consideration the slowness of the process if conducted without very frequent supervision, but more especially the introduction of a new element of danger, requiring certain precautions; and they cannot admit that any danger is connected with the more expeditious "Pharmacopœia" process, even when carried out on a large scale, if the directions of the "Pharmacopœia," particularly in regard to the strength of the nitric acid, are adhered to.

Mr. Louis Dohme's and Prof. Remington's papers treat substantially of the same subjects, though the former enters more deeply into the conditions connected with the conversion of one into another variety of phosphoric acid. Both papers point out a notable difference in the strength of the dilute phosphoric acid as prepared by the two processes of the "Pharmacopœia," and notice again the presence of impurities (soda) in the commercial glacial acid, which *retard* but do not *prevent* its complete change into orthophosphoric acid.

Graham, in his classical investigations of the phosphoric acids, has shown that the glacial acid may become contaminated with impurities from the vessels in which it may be prepared, and such impurities were proven to exist in commercial acid as early as 1860, ("Amer. Jour. Phar.," 1860, p. 193). The introduction of soda for the purpose of hardening glacial phosphoric acid was first noticed by Brescius in 1867, and subsequently confirmed by Prof. Prescott and by the authors of the two papers mentioned. Regarding the conversion of meta- and pyrophosphoric into orthophosphoric acid, Graham has observed that it may be done by boiling their aqueous solutions, more rapidly in the presence of free mineral acids. The conversion with water alone is best effected, according to Littleton Thompson (1874), by heating the concentrated solution, for which purpose Mr. Dohme finds a temperature of from 280° to 300° F. to be required.

The aqueous solutions of metaphosphates were found by Graham to be converted gradually into orthophosphates, but to effect a similar change of the pyrophosphates the presence of a mineral acid was found necessary, and, according to Weber, the most rapid change is produced by sulphuric acid. Reynoso, however, succeeded in 1852, in changing the meta- and pyrophosphates readily into orthophosphates by exposing their solutions to a temperature of 280° C. (536° F.) As far as the behavior to ferric chloride is concerned, the conversion may be completed by prolonged boiling in the presence of nitric acid.

The function of the pancreatic liquid, according to Lehmann, was first recognized by Valentin to consist in transforming into sugar such starch which may arrive in the duodenum in an unaltered condition. The discovery, by Claude Bernard, that the pancreatic liquid is capable of decomposing neutral fats into fatty acids and glycerin, has been admitted by all subsequent investigators; but the availability of this property for the purpose of digestion, as asserted by Bernard, has been

denied, Bidder and Schmidt, among others, proving that the decomposition of fats is prevented by the presence of acids and of the digestive fluids of the stomach. Dobell, in 1868, found the pancreatic liquid of pigeons always to possess an acid reaction, and to have the power of emulsionizing lard, but not to decompose it. In most cases, however, and more particularly after feeding, the reaction of the pancreas is alkaline, and this condition, or the absolute absence of free acid, appears to be necessary to effect the decomposition of the neutral fats. Whether this is or is not an important function of the pancreas in the animal economy seems to be of minor importance for the question before this committee; but, since pancreatic preparations have been recommended and used in medicine, it was important to know whether or not the pancreatic liquid would lose its identity or remain unaltered when in contact with the digestive principles of the stomach, and this question appears to be decided by the experiments of Prof. Scheffer, proving that the presence of free mineral acid, or of pepsin and free acid, not only *prevents* the action of the pancreatin, but that the latter is *destroyed*.

The committee deem this short criticism (made in a friendly spirit) as necessary to explain the conclusion to which they have arrived, viz., that the results attained to by the authors of these papers have been foreshadowed by the investigations of previous writers to such an extent that they do not, in the judgment of the Committee, *fairly* come within the provisions prescribed by Mr. Ebert in founding the "Ebert Prize."

CHAS. BULLOCK,
 W. H. PILE,
 JOHN M. MAISCH.

Philadelphia, March 17, 1876.

MASSACHUSETTS COLLEGE OF PHARMACY.—The tenth annual commencement was held at Parker Memorial Hall, April 20th. After some introductory remarks, by President S. M. Colcord, an address was delivered by Francis Wharton, LL.D. The degree of graduate in pharmacy (Ph.G.) was conferred upon the following gentlemen: Benjamin F. Bradford, Wm. A. D. Cragin, Eugene F. Dunbar and Thos. R. A. Shannon, of Maine; Chas. D. Chase, Ashton E. Hemphill, Wm. M. Howes, Edward O. Punchard, Benjamin F. Smith and Duane B. Williams, of Massachusetts, and John E. Groff, of Rhode Island. The valedictory address was delivered by Prof. J. M. Merrick, B. Sc.

NEW YORK ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.—At the annual meeting, held in Plimpton Hall, President P. W. Levering in the chair, several amendments were made to the constitution, and the following officers elected to serve the ensuing year: President, Henry S. Wellcome; Vice Presidents, J. W. Wood, R. J. C. Williams; Secretary, Edward Plummer; Corresponding Secretary, Wm. Wilson; Treasurer, A. J. Ditman; Members of the Executive Board, to serve three years, T. B. McElhenie, J. Messing; Delegates to American Pharmaceutical Association, B. F. Fairchild, H. S. Wellcome, J. Jungmann, F. C. Von Weber, M. D., Wm. Wilson, J. W. Wood. The retiring president delivered the annual address, giving a brief review of

the progress of pharmacy during the past century, and of this association during the past year, offering suggestions for extending the usefulness of it, after which the president elect, Mr. Wellcome, took the chair with acknowledgements. He presented some specimens of "Goa Powder," the remedy for ringworm which has been the object of some attention in the medical and pharmaceutical press during the past year. Regarding the subject of stale and adulterated herbs he said that he had received communications from different sources verifying the statements made at a previous meeting on the subject (see page 141 of this volume). He exhibited a specimen of fluid extract of *Eriodictyon Californicum*, and stated that recent reports showed it to possess positive action in bronchial affections, and that it promised to become a valuable remedy.

Mr. Wood read an interesting paper on the application of glycerite of starch, and urging its use in the place of Ung. Simplex, U. S. P.

A note, by J. P. Routh, on the following prescription was read, some difficulty having been experienced by some in dispensing it: \mathcal{R} , phosphorus, gr. vi, mucil. acacia, $\mathfrak{f}\text{ziii}$, oil gaultheria, $\mathfrak{f}\text{zi}$, tinct. nux vomica, $\mathfrak{f}\text{zvi}$, ferric tartrate, $\mathfrak{z}\text{v}$. He melted the phosphorus in absolute alcohol, agitated it until it became divided into minute globules, placed the test tube under a stream of cold water, continuing a brisk agitation until it was reduced to an almost pulverent form; this was added to the tartrate of iron, previously reduced to a fine powder, and triturated until the alcohol was entirely driven off; next the oil of gaultheria and mucilage were added, then gradually the tincture of nux vomica; the result was a permanent mixture.

The meetings of the association will hereafter be held quarterly, next one being in July, this best suiting the convenience of members.

ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.—The Twelfth Annual Report, we are informed, is nearly ready for distribution, and will be sent to all members in the course of a few days. Any graduate, desiring a copy of it, can obtain it by addressing the Treasurer, E. C. Jones, Fifteenth and Market streets, Philadelphia.

THE MARYLAND COLLEGE OF PHARMACY conferred the degree of Graduate in Pharmacy upon the following gentlemen at the Commencement, held in the Concordia Opera House, March 29th: Frank Dorsey (thesis, Lead and its compounds), Millard S. Gore (Paullinia sorbilis), H. Kornmann (Oxygen), Rich. B. Winder, Jr. (Sodium), Frank A. Meikle (Toxicology), Chas. W. Gardner (Percolation), Wm. G. Hurd (Tobacco), Henry Dietrich (Fluid extracts), Gust. A. Knabe (Acon. Napellus), Wm. Geo. Danim (Anthemis nobilis), Martin Lappe (Hydrogen), Edward Jones (Cytisus scoparius), Frank P. Zimmer (Phosphates), J. C. Michael (Carbon), Frank L. Wallis (Nickel and its salts), Henry O. Damm (Asarum Canadense), J. Br. Baxley, Jr. (Datura Stramonium), John H. Brooke (Fluid extracts), and John Stauff (Glycerin). The degrees were conferred and the College prizes distributed by the President, Dr. Jos. Roberts, and the Alumni prize by Mr. L. Dohme. Prof. J. F. Moore delivered the Valedictory Address.

At the regular meeting, held April 13th, the Hall Committee reported the purchase of the building and grounds heretofore known as the Grammar School, No. 3, which will be fitted up for the permanent use of the College.

At an adjourned meeting, held April 19th, Mr. J. F. Hancock read a paper on Modern methods in pharmacy (see p. 199), and exhibited a number of the modern preparations treated of.

Mr. W. S. Thompson exhibited samples of pills of dried sulphate of iron, made with gum syrup and with glycerin, the latter being much smaller and handsomer.

The precipitate from a mixture of Creuse's tasteless tincture of iron and phosphoric acid was exhibited, and, after some discussion, referred to Mr. L. Dohme for investigation.

THE NATIONAL COLLEGE OF PHARMACY AT WASHINGTON, D. C., at its fifth annual meeting, received the reports of the various standing and special committees, and adopted the recommendation of Prof. Oldberg, to consolidate the offices of recording and corresponding secretary. The president, Mr. R. B. Ferguson, then delivered his annual address, after which the following officers were elected to serve during the ensuing year: President, R. B. Ferguson; Vice Presidents, Chas. Becker and D. P. Hickling; Secretary, J. C. Fill; Treasurer, Wm. S. Thompson; Curator, H. E. Kalussowski; Board of Trustees, J. A. Milburn, W. G. Duckett, R. A. Bacon, W. B. Entwisle, Walter Drew and J. R. Major. At an adjourned meeting the report of the Committee on Pharmaceutical Education, was after due consideration, referred to the Board of Trustees, and the chair announced the various standing committees for the current year. A report on amendments to the constitution and by-laws was discussed and referred back to the special committee.

CINCINNATI COLLEGE OF PHARMACY.—The annual commencement took place at College Hall, on the evening of March 9th, the Germania Orchestra being in attendance. The exercises opened with prayer by the Rev. Henry D. Moore, after which the President, Dr. F. L. Eaton, conferred upon the following gentlemen the degree of graduate in pharmacy, (Ph.G.):

Chas. H. Angevine,	J. A. Koller,	Ed. A. Schmidt,
Anton Boehmer,	H. J. Marshall,	W. G. Sheickner,
Chas. Diehl,	William Rendigs,	C. D. Wangler,
Geo. T. Greer,	E. M. Roberts,	Albert Wetterstroem.
Emil Heun,	J. W. Rossiter,	

The address on behalf of the Board of Trustees was delivered by Mr. S. A. Miller, whose excellent remarks on "The relation of pharmacy to other professions" were well received. Prof. Fennel's medal, for the best examination in pharmacy, was awarded to William Rendigs; Prof. Wayne's, for the highest average in Materia Medica and botany, to Geo. T. Greer, and Prof. Judge's, for the best examination in chemistry, to J. W. Rossiter. The Alumni medal, for the best general average, was presented to George T. Greer, by the President of the Alumni Association, Mr. Jos. H. Feemster. Dr. Eaton, chairman of the Board of

Trustees, then stated that in the contest for the Alumni prize it occurred that the averages of the two highest were so close that by only one-half per cent. difference did the fortunate contestant carry away the honor. In view of this fact, and of the sterling ability exhibited by Albert Wetterstroem (the unlucky contestant) during his collegiate career, the Board of Trustees had decided to award him a medal for general proficiency.

The address, on behalf of the faculty, was delivered by Prof. E. S. Wayne, and the valedictory, on behalf of the graduating class, by Mr. Wm. Rendigs.

The presentation, by Chas. Angevine, on behalf of the class, of one hundred dollars, to be appropriated to the building fund of a new college building, was a pleasant feature in the evening's programme. The exercises then closed with benediction by the Rev. Henry D. Moore.

Later in the evening the Alumni entertained the new graduates, the faculty, board of trustees, and a number of invited guests, at their annual banquet.

ALUMNI ASSOCIATION OF THE CINCINNATI COLLEGE OF PHARMACY.—The following officers were elected at the annual meeting: President, Louis Schwab; Vice Presidents, W. J. Rattcliff and Wm. Rendigs; Treasurer, Theo. F. Norwood; Secretary, A. W. Bain; Corresponding Secretary, John E. Martin; Executive Board, W. B. Strang, John Rielag, Geo. F. Greer and Anton Boehmer; Delegates to the American Pharmaceutical Association, Jos. H. Feemster, Chas. F. Keener, L. Schwab, Theo. F. Norwood and Chas. P. Rendigs.

LOUISVILL COLLEGE OF PHARMACY.—The following gentlemen, having passed a successful examination according to the rules of the College, were by the Board of Directors declared "Graduates in Pharmacy," March 13th. C. W. Newton, W. H. Patterson, George Stauber, H. Huecker, H. Langenhan, J. B. Baird, M. Von Beust, L. R. Williams and H. Vonderbeck (examined June, 1875).

At the meeting of the Board of Directors, chosen at the annual meeting in March, the following officers were elected, viz., President, C. Lewis Diehl; Vice-Presidents, Emil Scheffer, Vincent Davis; Recording Secretary, Fred. C. Miller; Corresponding Secretary, Wm. G. Schmidt; Treasurer, Edward C. Pfingst; Curator, James A. McAfee; Directors, F. Lingelbach, C. Tafel, John Colgan, Wm. W. Smith and S. F. Dawes.

CHICAGO COLLEGE OF PHARMACY.—The commencement exercises took place at the First M. E. Church, March 13th. The degree of Graduate in Pharmacy was conferred by President J. W. Mill upon the following candidates: Julius H. Wilson (oxide of zinc), Fred. C. Werner (wild yam root), James M. Kirkley (glycyrrhizate of ammonium), La Motte Lovett (Pharmacopœia), Geo. W. Hoyt (Tinct. chloride of iron), J. Leonard Mulfinger (Mercury), Alvin G. Hammer (Syr. Ferri Iodidi), Geo. H. Loesch (Calomel), E. Geo. F. Bischoff (Emulsions), Almon R. Thurber (Medicated Waters).

Addresses were delivered on behalf of the faculty by Prof. H. D. Garrison, and on behalf of the graduating class by Mr. J. H. Wilson.

THE WESTERN WHOLESALE DRUG ASSOCIATION is the title of a new association composed of Wholesale Druggists in the Western States, and constituted in Indianapolis, March 15th and 16th, under the presidency of Mr. James Richardson, of St. Louis; Messrs. A. B. Merriam, of Cincinnati, and N. H. Collins, of St. Louis, acting as Secretaries. Various committees appointed at the first session reported at the subsequent sessions. The employment of commercial travelers found no favor, but the total abolition of the system being impossible now, various rules in regard to these were adopted. The following resolution relating to sales on credit was adopted:

Resolved, That this convention recommend that all credits be shortened as soon as possible, and as much as practicable, and that, as a rule, the goods sold for the least profit should be sold on the shortest time.

The following recommendations from the Committee on Legislation were adopted:

1. That, on the formation of a permanent association, the necessary steps be at once taken to put ourselves in communication and co-operation with Philadelphia and other Eastern drug exchanges to secure such tariff regulations or charges, as may best promote our mutual interests, and that similar action be taken regarding the matter of stamp tax, to render it as simple and as little burdensome as possible.
2. That a united effort be made to relieve wholesale druggists selling alcohol, wines or liquors for medicinal purposes only (so far as they can control it) from the necessity of exhibiting the wholesale liquor dealer's sign, now required under the general law, and so far as possible to secure exemption from unintelligent or unjust local enactments, or ordinances in regard to licenses.
3. That the law now in operation in New York and some of our Western States, requiring those desirous of practicing pharmacy to pass a competent examination before being allowed to do so, is a protection to the wholesale druggist, as well as to the public, and we, therefore, seek to extend its benefits to those States which have not yet adopted it.
4. That we emphatically condemn the adulteration of drugs and chemicals, especially such as are used as medicinal agents, and that we pledge ourselves to use our influence and our efforts to discourage it, and to elevate the standards of purity and excellence in such cases.

After the adoption of the constitution and by-laws, Mr. James Richardson was elected President; A. Peter, of Louisville, R. McReady, of Cincinnati, R. Brown- ing, of Indianapolis, Thomas K. Lord, of Chicago, and John Ewing, of Pittsburgh, Vice Presidents; A. B. Merriam, Secretary; and S. M. Strong, of Cleveland, Treasurer; Board of Control—C. F. G. Meyer, St. Louis, chairman; C. C. Riekirt, Cincinnati; R. A. Robinson, Louisville; Henry W. Fuller, Chicago; D. R. Noyes, St. Paul.

On motion of Mr. Noyes, of St. Paul, the following resolution was adopted:

Resolved, That the association is in hearty sympathy with the retail drug trade, and seek to promote their interests as well as our own.

The next meeting will be held in Chicago, on the second Wednesday of February, 1877.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—At the pharmaceutical meeting held March 1st, Mr. Rees Price read a paper on *the preparation of ferrous phosphate*. The British "Pharmacopœia" directs to precipitate 3 oz. of ferrous sulphate by 2½ oz. of sodium phosphate, in the presence of 1 oz. of sodium acetate, to stir well and filter, the acetate being added for the purpose of neutralizing the sulphuric acid set free, and liberating acetic acid, in which the ferrous phosphate is less soluble. The author found that, by following this process, 28.2 per cent. of iron remained dissolved in the filtrate, which could be precipitated by the further

addition of sodic phosphate; and he proposes to omit the acetate and increase the phosphate to nearly three times the weight of the iron salt (42 parts of the former and 15 of the latter were found necessary), when the filtrate will scarcely contain traces of iron.

Prof. Attfield was not previously aware that so large a proportion of iron could be lost by the "Pharmacopœia" process, and explained the action of the excess of the phosphate used, as suggested by Mr. Price, by the conversion, through the liberated sulphuric acid, of the ordinary sodic phosphate Na_2HPO_4 into NaH_2PO_4 . This monosodium phosphate could be reconverted into the ordinary or disodium salt by reaction with carbonate of sodium.

Mr. Brownen had obtained almost pure ferrous phosphate as a white crystalline magma by acting with phosphoric acid upon iron filings or turnings, and straining the solution.

Mr. John Moss read a lengthy and very interesting paper on the *structure and development of Pareira stem*, which cannot well be abstracted. It is printed with two wood-cuts in the London "Pharmaceutical Journal," March 4, pp. 702—707.

Mr. W. A. H. Naylor read a paper on *Cosmolin*, referring therein to the investigations of Dr. A. W. Miller, apparently without being aware of the later experiments ("Amer. Jour. Pharm.," 1875, p. 257). Mr. Naylor's object being to determine its composition, he found it to consist of hydrocarbons with a little (.69 per cent.) moisture, and traces (.04 per cent.) of ash. By dissolving it in warm ether and collecting the portions separating on exposing the solution to different degrees of low temperature, he obtained fractions melting between the extremes of 16.5 and 53.5° C. Similar results were obtained with each of the two portions of cosmolin, soluble and insoluble in boiling alcohol. By fractional distillation, portions having different melting points were likewise obtained. The author concludes from his experiments that cosmolin is a mixture of paraffins.

At the last meeting of the session, held April 5th, Mr. T. H. Hill presiding, Professor Attfield called attention to a sample of foreign *crystallized glycerin*. To obtain it, it appeared to be necessary that the glycerin should be perfectly pure, fairly cold, and subjected to considerable vibration. The crystals, it was said, could be used for purifying slightly impure glycerin, in which they would grow, leaving the impurities in the mother liquor.

Mr. E. M. Holmes stated that the leaves and flowers sent, under the name of *Garrya elliptica*, by Prof. Maisch (see "Amer. Jour. Pharm.," 1875, p. 279), appeared to belong rather to *Garrya Fremontii*, in having the leaves smooth underneath and not undulated. A living specimen of *G. elliptica* was exhibited for comparison.

A paper by T. H. Powell and J. Bayne was read, in which experiments were detailed, made for the purpose of ascertaining the nature of the product obtained by the action of *hydrocyanic acid upon calomel*. After giving the observations of Scheele, Regimbeau, Soubeiran and others upon the black powder formed by the two compounds, the authors ascertained that the presence of free hydrochloric acid prevents the dark coloration. On adding hydrocyanic acid to calomel, a liquid results which contains free hydrocyanic and hydrochloric acids and mercuric chloride and cyanide; if the remaining powder be repeatedly acted upon by fresh portions of hydrocyanic acid, a black powder remains, which becomes grey on drying, and

which is probably metallic mercury. Prof. Attfield did not agree with this conclusion; metallic mercury was obtained by sublimation, but that the residue was nothing but metallic mercury had not been proven. He hoped that the authors would continue their researches

Mr. W. Willmott read a paper on *Linimentum Saponis, Br. P., with special reference to its employment in hospital practice*, in which the directions contained in the various editions of the London and British "Pharmacopœias" are discussed, and compared with the formulas in use by five of the London hospitals; the author suggests the following modification of the formula: 16 oz. of soft soap (free from caustic potash), 8 oz. of camphor, and 2 fl. oz. of oil of rosemary are mixed with 5 pints (100 fl. oz.) of rectified spirit (spec. grav., 0.838), the mixture is occasionally stirred during twenty-four hours, strained or filtered, and mixed with 3 pints (60 fl. oz.) of distilled water. The spirit rapidly disintegrates the soap, and dissolves the neutral portion only, leaving behind the irritating alkaline matter, which is soluble in water. The liniment remains clear and free from sediment at all temperatures.

In the discussion which followed, the speakers expressed themselves against the substitution of soft for the hard soap ordered by the "Pharmacopœia." The excess of soap used in the British "Pharmacopœia" process could be utilized by pressing it in a mould, and using it for washing.

PHARMACEUTICAL SOCIETY OF PARIS.—Mr. Coulier presided at the meeting held February 2d, at which Mr. Planchon gave an account of the recent researches on the various transformations of the larvæ of cantharides.

Mr. Legrip read a note on *Dietheralysis*,¹ which is the name given by him to a new method for extracting vegetable juices; it consists in mechanically dividing the fresh plants or their parts, collected during the period of their greatest activity, and then subject them, in a suitable apparatus, to the direct action of the ether. Two layers of liquid are formed, the upper green one being a solution of chlorophyll and fat in ether, the lower aqueous layer being thick and brown, and containing all the proximate principles, dissolved or not, which have been expulsed from the cells with the vegetable fluids under the pressure of the ether. Even odorous juices retain, under the ether, their peculiar perfume.

The facts stated can be readily demonstrated by making a number of perforations in a test-tube, enclosing in it a fresh leaf and suspending the tube in a larger vessel containing ether, and closing the latter hermetically. The ether will soon begin to assume a green color, and the juice to separate in minute brownish drops, and the leaf will finally be left completely decolorized. It is evident that the constituents will by this process be obtained in their natural condition, without any alteration.

Mr. Limousin observed that ether would dissolve many proximate principles; but Mr. Legrip regards the action of the ether to be mechanical rather than solvent.

Mr. Limousin called attention to an observation made by A. Duhomme, according to which a hydrometer does not indicate for a time the correct density of the liquid, if this should run over either during or after the immersion of the instrument.

¹ From *δια*, through, by means of; *αιθηρ*, ether; *λυσις*, separation, or *λυω*, to discharge, loosen.

The phenomenon was explained by Mr. Coulier to be due to the *superficial tension of liquids*, which has been studied by Mr. Plateau.

A paper on *Dragon's blood and its falsifications*, by Mr. Henry Bretet, was read. True dragon's blood is not scratched by the finger-nail, yields a red, non-adherent powder, when heated gives off red vapors, and is found to contain very little iron. False dragon's blood, which appears to be made by mixing oxide of iron with resin, differs in each of these particulars, but sometimes imparts a purple-red color to alcohol, proving that some true dragon's blood had been used in manufacturing the imitation.

Mr. Guichard made some remarks on *fluid and syrupy extracts*, and noticed more particularly the fluid extracts official in England and the United States. For convenience in dispensing, he has used for some time preparations which, while representing solutions of solid extracts, are prepared by concentrating infusions of the drug to a certain extent, adding some glycerin, and evaporating until the residue represents approximately a solution of one part of extract in an equal weight of glycerin. The author prefers this method to the solution of the solid extract in glycerin or other solvents, and regards the addition of some glycerin, even to ordinary extracts, to be advantageous. Mr. Desnoix coincided with these views, but Mr. Mialhe considered the addition of glycerin unnecessary.

Mr. Petit gave a summary of his researches of the action of *pancreatin upon albuminoid substances*, whereby crystallizable compounds, leucin and tyrosin, analogous to the products of excretion, are formed. The residue from the action of *pepsin upon albuminoids* is always amorphous.

At the meeting held March 1st, a note by Mr. Frebault, of Meursault, was read, on the use of *alkaline picramates as a test for acids and alkalies*. The picramates (dinitramidophenates) of the alkalies and of calcium have a magnificent red color, which by free acid is changed to greenish-yellow, the red being restored by an alkali. A solution of the ammonium salt is readily obtained by acting with an excess of sulphhydrate of ammonium upon an alcoholic solution of picric (trinitrophenic) acid. The calcium picramates keep very well, and may be employed in solution or with paper like litmus.

Another paper, by the same author, was on *The action of iodine upon carminic acid and the coloring principle of logwood*. An infusion of cochineal with distilled water is not affected, but on the addition of a little alkali, or by using ordinary water, is instantly decolorized. The same reaction takes place with an infusion of logwood. Free acids prevent the reaction; the most convenient reagent is a solution of iodine in potassium iodide. The author believes this reaction to be available for the rapid valuation of cochineal, carmine and logwood, and for the estimation of iodine. Fuchsin and the coloring principles of red poppy, mulberries and wine are not decolorized.

A discussion ensued on the *yield of extracts*, Mr. Hoffmann believing that notable differences in the yield from the same material were not obtained, provided the process was not changed. Mr. Guichard, however, cited the experience of several authors, proving the variability of the yield.

To detect the *presence of fuchsin in wine*, Mr. Yvon recommended to treat the suspected wine with animal charcoal, which retains the fuchsin, and from which it may be afterwards obtained by the aid of alcohol.

EDITORIAL DEPARTMENT.

THE INTERNATIONAL EXPOSITION AT PHILADELPHIA will have been opened (May 10th) by the time the present number reaches some of our readers, who are undoubtedly to some extent familiar with the extent which it promises to assume. That there will be much of interest to the pharmacist to see and a great deal to learn, may be expected. Many new and old remedial agents, which are but partially or not at all known in this country, many new or improved apparatus and devices bearing upon the drug business, will doubtless be found among the multitude of articles which have been collected in Fairmount Park from all sections of the globe. While it can scarcely be expected that everything related to pharmacy, more especially all the numerous chemical and pharmaceutical preparations and appliances should be of sufficient importance to claim the same attention, yet much will be noticed possessing lasting intrinsic value. While our readers will not look for minute descriptions of all the features of this Exposition, it will be our aim to select from that which will be presented such matters for more detailed consideration which may appear to be more especially adapted to the wants, or serve for comparison with the products of the American pharmacist.

In this connection, we desire to direct the notice of our readers to the arrangements made by the Philadelphia College of Pharmacy, for the convenience of those visitors more or less directly connected with the drug trade. The Actuary is now daily present at the College building, and prepared to give information and assist strangers in their endeavors to most profitably spend the time which may be at their disposal on the occasion of their visit. The pharmacists, druggists and chemists, from whatever part of the globe they may hail, will be welcome.

The Philadelphia Drug Exchange, we are informed, are likewise prepared to show similar civilities to druggists, so that no one visiting during the Exposition need feel embarrassed for want of advice to further his object.

THE TWENTY-FOURTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Philadelphia, September 12th, and many members will postpone their trip to the International Exposition until that time, when they may expect to see what may be new and interesting in the pharmaceutical and chemical line, in connection with others who are interested in the same pursuit. An interchange of ideas may thus be had, for which rarely any better opportunity will be afforded. The Committees of Arrangements, appointed by the National Association and the Philadelphia College, are actively at work, and we understand that it will be among their main endeavors to so arrange matters as to afford every attending member the best opportunities of examining minutely and profitably such goods in which, as pharmacist or druggist, he may expect to be most deeply interested, without, in his search after all the novelties, being compelled to neglect the sessions of the Association. The ladies who may accompany the members will also be well cared for by the ladies of this city.

The present year of the Centennial independence of the United States is also of special interest to the pharmacists of this country. Five years ago, the Philadelphia College of Pharmacy celebrated the semi-centennial anniversary of its foundation; three years hence, the New York College will have attained its fiftieth year since its organization; 35 years have passed by since the Maryland College obtained its charter, and 20 years since it was reorganized, and on the 15th of October next it will be twenty-five years since, in New York, the first Convention of Pharmacists and Druggists met, which took the initiatory steps to organize the American Pharmaceutical Association.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Proceedings of the Vermont Pharmaceutical Association, at the sixth annual meeting, held at St. Johnsbury, October 13th and 14th, 1875. Rutland: 1876, 8vo. pp. 40.

On page 570, of our last volume, will be found a brief account of this meeting; the pamphlet before us contains the various reports in full. Of particular interest to us is the report on legislation, which gives the draft of a plain pharmacy bill, in which, with the least possible complication, sufficient competency of the pharmacists, and their assistants, is aimed at. The bill passed the House by more than a two-thirds vote, but failed in the Senate through the treachery, as the committee tell us, of the Senator from Burlington, a patent medicine dealer, who promised to "take care of the bill," and labored faithfully to defeat it. Our friends deserve better luck next time.

Two papers, on displacement apparatus and on fluid extracts, have been published in the pamphlet; the latter speaks of the faulty official formulas for various of the kinds, but unfortunately omits to point out either the faults or remedies therefor. The process recommended in the paper is the same as that patented by Mr. Spencer Thomas, in 1865 ("Am. Journ. Pharm.," 1865, p. 85, 1866, p. 218, containing also Prof. Procter's comments).

We regret to learn that all the books, records, papers, &c., of this association were consumed by fire, February 16th, which totally destroyed the Secretary's, Mr. A. W. Higgins', store.

Formule for non-official preparations in general use in the District of Columbia.—Published by E. L. Duvall. Washington: 1875, 8vo. pp. 48.

As this formulary has been prepared by a joint committee of the Medical Society of the District of Columbia and the National College of Pharmacy, an authority is attached to it, at least for the district in which the national capital is situated. Speaking of it as a whole, we are much impressed with the practicability of the formulas framed; but we regret that the joint committee did not see fit to adhere more closely to the formulas for elixirs adopted by the Amer. Phar. Asso. The name of elixir aurantii is very appropriate for the simple elixir, and the absence of the slight amount of cinnamon is immaterial. We object, however, to such names

as elixir calisayæ, when the preparation is made with the sulphates of the four commoner cinchona alkaloids, and calisaya bark is not used. The deviation, in strength, of some formulas from those of the Amer. Phar. Asso., of 1875, is explained by the former having been adopted as early as last August.

Liquor ergotæ should have been called tinctura ergotæ, being made from ergot, with alcohol of about 30 per cent. Syrupus calcii lactophosphatis is directed to be made with lactophosphate of calcium, but a formula for the latter is not given. For making syr. ferri oxidi the saccharated oxide of iron of the German Pharmacopœia is used, without giving a formula for its preparation. If it was intended to refer the apothecary to that pharmacopœia, then formulas for compound liquorice powder and breast tea were likewise unnecessary.

We shall endeavor to make room, in our next issue, for some of the formulas which have not heretofore been published in the "Journal"

Filth diseases and their prevention. By John Simon, M.D., F.R. C. S. Boston: Jas. Campbell, 1876, 12mo, pp. 96.

The author of this masterly essay, being Chief Medical Officer of the Privy Council and of the Local Government Board of England, has had unusual facilities to familiarize himself with the subject, and gives many practical suggestions for the prevention of typhoid fever and allied diseases, the origin of which may be traced to the accumulation of filth. Properly regulated sanitary work being, here, still in its infancy, the Massachusetts State Board of Health have done well to republish this essay and to recommend its being read, and the suggestions heeded by every intelligent person.

Lecciones de Botanica arregladas segun los principios admitidos por Guibourt, Richard, Duchartre, De Candolle y otros. Por Joaquin y Juan Dondé (padre é hijo), farmaceuticos titulados, quimicos y naturalistas. Mérida de Yucatan: 1876, 12mo, pp. 259.

Lessons in botany.

Without pretending to be familiar with the literature of Yucatan, we should regard the volume before us as a valuable addition to other available works, on account of its simple and systematic arrangement and the general correctness and conciseness of the manner in which the researches in morphological, physiological, pathological and systematic botany have been treated. To our readers it will be of interest to learn that one of the authors, of whom we brought a biographical sketch on page 96, of this volume, was formerly a contributor to the "Journal."

Bulletin of the Bussey Institution (Jamaica Plain, Boston), part v. Cambridge: Press of John Wilson & Son, 1876, 8vo, pp. 100.

Of the eight papers contained in this part, three are from the pen of Prof. F. H. Storer, viz: Composition of date-stone and of the stones of peaches and prunes, analyses of potassic fertilizers and occurrence of ammonia in anthracite; four papers on the disease of olive and orange trees in California, on grape-vine mildew, on the black knot and a list of fungi near Boston, by Prof. W. G. Farlow, and a

report on the Arnold arboretum by the Director, C. S. Sargent. Six well-executed lithographs accompany this pamphlet, which concludes the first volume of the series.

Report of the Board of Administrators of the Charity Hospital to the General Assembly of Louisiana, session of 1875. New Orleans: 8vo, pp. 105.

Besides the special reports and statistical tables, which may be looked for in such a publication, we find a historical sketch of this institution, by James Burns, M.D., which goes back to the times of Louis XIV and of the foundation of the colony, but, as may be expected, enters more into the details of the operations during the years last past.

The reception, from the authors, of the following reprints is hereby acknowledged :

Studies upon essential oils. By G. Dragendorff.

Structure and developement of Pareira stem, Chondodendron tomentosum R. et. P. By John Moss.

Vaseline. By John Moss.

On further researches on the dissociation of Molecules in solution. By Chas. R. C. Tichborne.

The Opium habit and "Opium-mania cures." By Stanford E. Chaillé, A. M., M.D., &c.

This last pamphlet exposes the criminal doings of a doctor, with whose practices the readers of the "Journal" have already become acquainted, on page 464, volume for 1873. The *Ext. Picus porteana* appears to have been changed now into an "opiumania cure," and the composition was most likely changed also, since Mr. J. Johnson reports it to contain "a good deal of substance in solution" and found only about *five grains of opium* in half a fluidounce, whereas Prof. Wayne obtained *4.4 grains of morphia* in the same quantity.

OBITUARY.

ZADOC DOUGLASS GILMAN died in the city of Washington, D. C., March 15th, in the 60th year of his age, after a brief illness. He was a native of Alexandria, Va., but removed with his parents to Washington, where, after having received a good education, he entered the drug business with Mr. Seth Todd, remaining with his employer as assistant. After the death of the latter, Mr. Gilman purchased the store and business, which he conducted until his demise. He was one of the first members of the various local societies organized in the National capital for the promotion and advancement of pharmacy, and liberally contributed to their support. Energetic, yet amiable and courteous in conducting his business, he was devoted to his family, and an active and useful member in the various public organizations in which he interested himself. Within less than two years, the National College of Pharmacy has lost in him by death, the third member of its first Board of Trustees.

THE AMERICAN JOURNAL OF PHARMACY.

JUNE, 1876.

POWDERED DRUGS UNDER THE MICROSCOPE.

BY MARK W. HARRINGTON, M.A.

Assistant Professor of Botany in the University of Michigan.

I. PRELIMINARY.

The writer proposes, in this and, perhaps, several succeeding articles, to point out to pharmacists the utility of the microscope as a means of identifying powdered drugs, and of ascertaining their purity. He does this because he is convinced that, notwithstanding the writings of Hassall, Pocklington, Flückiger, Planchon and some others, the practical usefulness and ready availability of the microscope as a means of organic analysis, is not fully appreciated.

This instrument is especially useful in the examination of organic bodies. One would expect that when two parts of plants differ in external appearance, corresponding differences would exist in the minute structure as well, and such is found to be the case. It is not too much to say that, for those having the necessary previous knowledge, it is no harder to distinguish two powders under the microscope than it is to distinguish the two bodies from which the powders are derived. There is no more difficulty in telling ground mustard from ground horse-radish, and, where they are mixed, in picking the one out from the other, than there is in telling the mustard-seed and the horse-radish-root. Wherever any powdered drug has traces of organic structure, the microscope can identify them and ascertain their source. In these cases the use of the microscope can properly accompany the work of chemical analysis. It can precede and indicate what the chemist is to look for, or it can follow and verify the results of his work. In some cases, indeed, microscopical analysis can do successful labor in fields where chemistry is powerless. Chemistry, for instance, cannot distinguish between the various starches—wheat-starch, corn, potato, arrow root, sago starch, etc.; it can only show

that amylaceous matter is present. The microscope, on the other hand, can easily distinguish between them.

One great advantage in the use of the microscope is the readiness with which results can be obtained from it. But a moment is needed by the skilled microscopist to distinguish the various starches, or to analyze the various proprietary flours, prepared foods, farinas, etc.; and even such complicated mixtures as the tooth-powders can be unraveled in a short time. The chemist would have to spend much time over the latter, if, indeed, he could succeed in performing it at all.

For the work contemplated in these papers a complicated and costly instrument, with all the modern expensive appliances, is not required; an inexpensive microscope, with a magnifying power of 200 or 300 diameters, is sufficient. One of the cheaper compound microscopes, with an inch objective, can be made to answer, a half inch or a quarter inch objective should be added as soon as practicable, as it will be sometimes needed. They can be obtained of any reputable maker or dealer at prices varying from \$25.00 to \$150.00, depending on the character of the workmanship and number of objectives and accessories.

Instructions concerning the use of the microscope must be looked for in books devoted to that subject. With cleanliness, care and some patience any one can use the instrument successfully. When the tissue of a drug is to be examined, it should be softened by soaking in water, or some other fluid, and then as thin sections as possible be taken in several directions. The sections can be transferred to a glass-slip by means of a camel's hair brush. They should be deposited in a drop of water and covered by thin glass when they are ready for examination. If greater transparency is required, the sections can be placed in glycerin; still greater transparency can be obtained by placing dry sections in Canada balsam. If a powder is to be examined, a very small part of it should be placed on the glass-slip in water, glycerin or Canada balsam.

II. STARCHES.

The starches form powders of a simple nature, with which the unpractised observer will do well to begin. They vary very much in form, size and structure, and to some extent in chemical characteristics.

The *color* of starch is usually pure white. In some cases a tinge of blue can also be seen, as in some wheat-starch, while the starch from the potato has a slightly yellowish cast. The fineness of the starch powder depends on the *size* of the individual grains, except where the grains are artificially agglomerated, as in sago and tapioca; the former is in small, round, brownish grains, while tapioca is in larger, irregular, white fragments. The individual starch grains vary much in size, though they are pretty constant for any given species. The various sizes will be described in the special descriptions to follow; here it is sufficient to say that oat, rice and rye starches represent the smallest grains, while those of corn starch are not much larger. The medium size is found in the grains of wheat and arrow-root starch. The largest grains are found in potato and canna starch. In the last two the unaided eye can distinguish the largest individual grains, but in nearly all others they can be seen only under the microscope. The *specific gravity* is more than that of water, though it varies much with the state of dryness of the starch. Its average is given, by Wiesner, at 1.5. It, however, varies with the different species of starch. The grains contain considerable water—as high as 30 per cent. when fresh, reduced sometimes to 7 per cent., when air dry.

The grains, when exposed under the microscope to hot water (140° F. or above) swell, then burst, and finally form a homogeneous paste. The same process occurs, and can be easily observed, microscopically, when they are tested with dilute alkalies or mineral acids. They are insoluble in cold water, alcohol and ether. The grains turn blue when brought in contact with a solution of iodine, a simple solution of iodine in water is sufficient for this very delicate test. This is a very satisfactory test for microscopical use, as it will betray at once the smallest proportion of starch in the tissue under examination. The iodine solution can be applied in this way: the tissue or powder to be examined is placed on the glass slide in a drop of water, and a thin glass cover is placed over it; it is then placed under the microscope and focussed, the stage of the microscope being tilted a little, if practicable; a drop of the iodine solution is then placed on the slide, at the upper edge of the cover. It will gradually spread in the water and through the tissue examined; meantime the eye at the microscope watches the changes it causes. Should it not draw through readily, a bit of blotting paper, placed at the opposite edge of the glass cover,

will take up the water, and the iodine solution will come in to take its place. The color of the starch grains affected by iodine, although usually blue, may vary, according to the amount of the iodine, from a light violet, through blue, to blue-black.

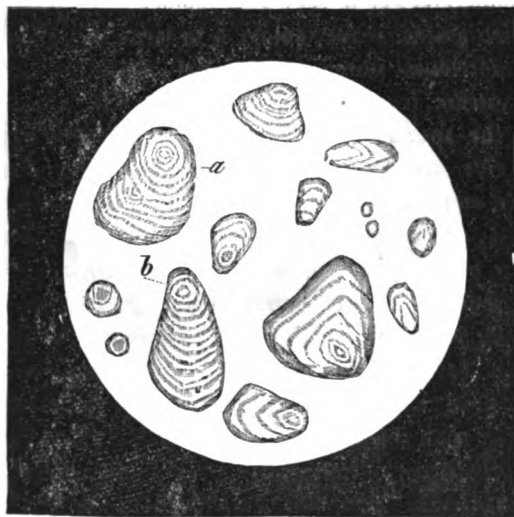


FIG. 1. Grains of potato starch. *a* and *b* are from a fresh potato, the others have been dried.

Under the microscope the starch-grains present the form of minute grains, of a form and structure characteristic for each species. They are usually bounded by curved surfaces, — spherical, elliptical, egg-shaped, lens-shaped, etc., but sometimes they have flat surfaces as well. They usually contain a dark spot, line or cross within, which is sometimes central, sometimes eccentric.

This spot is called the nucleus and is usually small and round in starch found in fresh tissues, slit or cross-shaped in grains which have been dried (Fig. 1).¹

The position and character of the nucleus affords a valuable means of describing the grains. The grains, also, frequently show a series of rather faint lines concentric about the nucleus. When present, they sometimes can be distinguished only with careful focussing and close examination, and in many starches they are entirely absent. Sometimes the grains have more than one nucleus (Fig. 1, *a*) in which case they are said to be compound. The compound grains may consist of only two simple ones, as in tapioca, or three, as usually in sago, or of a great many, as in rice, oat and buckwheat.²

¹ All the figures in these papers were drawn from nature, by LOUISA M. REED, of ANN ARBOR, MICH., whose work is accurate and careful, as can be tested by comparing it with the actual objects.

² For those who wish to study the microscopical characters of starch more in

Having given the general characters of the starch powders, we will now pass on to the consideration of the species of interest to the pharmacist.

I. POTATO-STARCH (Fig. 1).

This starch is not officinal, but the ease of obtaining it and the size of the grains make it the best and most convenient form for the inexperienced microscopist to begin with. Besides, it is frequently used and still more frequently named as an adulterant of other powders and is, consequently, important to the pharmacist. For examination fresh, it can be easily obtained from the potato, nearly the whole of the interior of which is made up of it.

It forms a fine, white, glistening powder, with small, irregular, pulverulent masses intermixed. It crackles slightly when rubbed between the fingers. When examined carefully, it can be seen to have a yellowish cast of color. It has a slight taste like raw potato, and a faint acrid odor. The latter is brought out more decidedly by the application of alcohol or chlorhydric acid.

The grains vary much in size, due, probably, to unequal development, the youngest being smallest, the greatest length attained is about 50 μ .¹ The form is usually oval, egg-shaped, elliptical or round-triangular. The smallest and youngest grains are nearly spherical. The

detail, the following references may prove useful: Hassall's *Adulteration in Food and Medicine*; Soubeiran, *Dictionnaire des Falsifications*; Wiesner, *Rohstoffe des Pflanzenreiches*, pp. 239-289; Planchon, *Détermination des drogues simples*, Vol. II, chap. XIII; Harrington, *American Naturalist*, April and June, 1875, Vol. IX, pp. 193-198, 339-346.

For the examination of starch, Thomas Greenish recommends especially the following:

"Saturate distilled water with creosote, and take of
the filtered solution, 3v
Spirit of wine, 3iss
Glycerin, 3iss."

The starch could, probably, be preserved, in this solution, as a permanent microscopical specimen.

¹ μ =ten-thousandths of an inch. For information as to methods of measurement, the works on microscopy must be consulted. Where the pharmacist has not access to them, the measurements given will be useful to him by indicating the relative size of the bodies measured. The writer uses the small unit μ , so that fractions can be avoided, and the comparison of length can be made readily, without reduction. Fractions of inch are used because they are much more generally used and understood in this country than millimeters.

nucleus is near the smaller end. The distance from it to the smaller end is usually $\frac{1}{4}$ to $\frac{1}{8}$ of that to the larger end. The grains are almost invariably simple, but occasionally one with two nuclei is found (Fig. 1, *a*), and very rarely one with three nuclei.

Potato-starch is much used in the arts for making a stiffening paste, and for other purposes. It is said to be sometimes surreptitiously replaced by poor grades of wheat-starch (Wiesner). It is also sometimes mixed with ground fibre (probably woody), and is adulterated with earthy matter (Soubeiran). Its use as an adulterant of arrow-root and other starches and drugs has already been mentioned.

In the next number, the most important of the other pharmaceutical starches will be described and figured.

ANALYSIS OF CINCHO-QUININE.

BY EBENEZER M. WELLS, PH.G.

(*Abstract from an Inaugural Essay.*)

Several years ago, a preparation called Cincho-Quinine was thrown upon the market, which is represented as having all the constituents of cinchona-bark in their alkaloidal condition, and as being fully equal to sulphate of quinia in therapeutical effect, when given in the same dose. By diligent and profuse advertising, and being sold at a lower price than sulphate of quinia, it has, in many localities, gained considerable favor, and is frequently prescribed by some practitioners as a substitute for sulphate of quinia, solely upon the testimonials in the circulars, which accompany each bottle, and from which it appears that many have used this nostrum with success.

This nostrum was analyzed in 1870 by Wm. T. Wenzell, in 1874 by Albert E. Ebert, in 1875 by Profs. Scheffer and Diehl, and in 1875 by Profs. S. P. Sharples, F. A. Genth and others. Neither Wenzell nor Ebert were successful in determining the presence of quinia, Profs. Scheffer and Diehl found quinia, quinidia, and probably cinchonidia ("Amer. Journ. Pharm.," April, 1875) in very small quantities. The other analysts succeeded in determining the presence of quinia, quinidia and cinchonidia, besides cinchonia ("Drug. Cir.," April, 1875, p. 85); but the amount of each is not stated, which in justice to the public at large should have been done.

What is cincho-quinine? Does it really contain quinia, and how

much? are questions which have often been put to me by both physicians and customers. I could not give the desired information, and have therefore determined to subject this nostrum to a chemical analysis.

I used for my experiments two samples of cincho-quinine, which I shall designate as "new" and "old." The new sample had been obtained from the manufacturers through Powers & Weightman, from whom I purchased it in December, 1875. The old sample I procured through Prof. J. M. Maisch, from Mr. J. L. Lemberger, of Lebanon, Pa., who obtained it from a New York agency July 18th, 1873. The experiments were made in the laboratory of the Philadelphia College of Pharmacy, under the supervision of Prof. Maisch.

The qualitative examination of cincho-quinine was conducted in the same manner as detailed by Profs. Scheffer and Diehl in the paper referred to above, and gave the same results, proving the presence of ammonium sulphate, cinchonia sulphate and cinchona alkaloids, also a small quantity of organic matter, which could not be dissolved in alcohol, but remained behind with the ammonium sulphate, and with it was soluble in water.

To determine the amount of the various constituents of this nostrum, De Vrij's method for separating the cinchona alkaloids was first tried; but it soon became apparent that this method would not yield correct results, in consequence of the great excess of cinchonia present. Mixtures of the alkaloid, in approximately the same proportion as they exist in this preparation, according to the published essays, were made; and, after trying several modifications, the following process was found to yield satisfactory results, and was therefore used in assaying both samples of cincho-quinine:

Six grams of the mixed cinchona alkaloids were dissolved in dilute hydrochloric acid, the solution precipitated by ammonia, the precipitate washed upon a filter with cold water, and then dried. The washings were evaporated to dryness, and the residue treated with ether; after evaporating the latter, a small quantity of alkaloid was left behind which was added to the larger portion, giving the total amount of alkaloids present, the loss from the original weight taken indicating non-alkaloidal compounds. The saline matter insoluble in ether was dissolved in water, in which it was readily soluble, and the sulphuric acid present determined in the usual manner by precipitating with chloride of barium. About one-half the dried alkaloids was then rubbed to a

fine powder—the other portion being reserved for verifying the results obtained—and macerated for thirty hours with sufficient ether to cover it, afterwards transferred to a filter, and washed with ether until at least four fluidounces of filtrate were obtained, which were evaporated in a beaker, the result indicating the total amount of alkaloids soluble in the quantity of ether employed. On treating this residue with 76 times its weight of ether, a residue was left, which, after dissolving in water by the aid of sulphuric acid, was not affected by chlorine water and ammonia, proving the complete absence of quinia and quinidia, nor could a precipitate be obtained on the addition of a concentrated solution of pure Rochelle salt and setting aside for two days; cinchonidia was therefore likewise absent, and the undissolved portion was cinchonina.

The ethereal solution was again evaporated to dryness and the residue weighed, afterwards treated with 40 times its weight of water and sufficient sulphuric acid to obtain a solution, which was carefully neutralized by ammonia.

With the old cincho-quinine a perfect solution was obtained, but the new cincho quinine left some greenish resinous globules behind, which would likewise not dissolve in boiling acidulated water. The filtered solution of the sulphate was treated with tartrate of sodium and potassium, and the precipitated tartrate of cinchonidia collected after two days, washed and dried; one part of this tartrate representing .804 part of cinchonidia, the actual amount of this alkaloid present, is easily calculated.

The filtrate and washings from this precipitate were concentrated to the original measure and mixed with strong solution of potassium iodide in excess. On the following day, the precipitated hydriodate of quinidia was collected, washed and dried, and its weight multiplied with 0.718, to ascertain the total amount of this alkaloid.

The filtrate from the foregoing precipitate contained all the quinia. To avoid the solvent action of the chemicals previously added, upon the herapathite, it was determined not to estimate the quinia in this form, but to weigh it as pure alkaloid. Accordingly, the liquid was evaporated and the dry mass treated with ether, on evaporating the ether, iodide of ammonium was found in the residue. It was therefore dissolved in water, boiled with sufficient sulphuric acid to eliminate all hydriodic acid, precipitated by ammonia, and repeatedly agitated with fresh portions of ether, which, on evaporation, left pure quinia.

The amount of moisture contained in cincho-quinine was ascer-

tained by drying a weighed sample at about 150° F., and the ammonium by treating another portion of cincho-quinine with boiling alcohol, and weighing the undissolved portion as ammonium sulphate.

The results of these assays, calculated for 100 parts of material, were as follows :

	New sample.	Old sample.
Sulphuric acid (SO ₃),	6.516	5.016
Ammonium (NH ₄),	1.360	1.380
Water, determined by heat,	4.098	3.174
Loss (mainly water of crystallization),	0.359	0.040
Total non-alkaloid matter,	<hr/> 12.333	<hr/> 9.610
Quinia,	0.466	0.240
Quinidia,	1.250	1.820
Cinchonidia,	0.717	0.920
Resin and loss,	0.583	
Cinchonia,	<hr/> 1.384	<hr/> 2.440
Total am't dissolved by 1st treatment with ether,	4.400	5.420
Cinchonia left undissolved on 1st treatm't with ether,	83.267	84.970
	<hr/> 100.000	<hr/> 100.000

The total amount of cinchonina, a portion of which is combined with sulphuric acid, was therefore 84.651 per cent. in the new, and 87.410 per cent. in the old sample, while the quinia was present in one case to the amount only of less than one-half, and in one sample less than one-quarter of 1 per cent.

REMARKS BY THE EDITOR.—It will be of interest to recapitulate, in connection with the above essay, the quantitative results obtained in previous analyses, more particularly the amount of the three higher priced alkaloids, present in cincho-quinine, which form the correct basis for estimating its commercial as well as medicinal value. Wenzell obtained 2.5 per cent, Scheffer and Diehl (see "Amer. Jour. Phar.," 1875, p. 205), from four samples, 3.00, 3.25, 2.15 and 3.10 per cent., and Wells (4.400—1.384=) 3.016 and (5.420—2.440=) 2.980 per cent. ; the average of these seven assays gives 2.86 per cent. of higher priced cinchona alkaloids, from which figure the lowest amount on record differs by .71 or 25 per cent., and the highest amount recorded by .39 or nearly 14 per cent., while the proportion of the lowest to the highest figure, 2.15 and 3.25, is as 2 : 3.

A still greater variation is observable in the percentage of quinia, small as it is ; the lowest one found (Wells) being .24, and the high-

est (Scheffer and Diehl) .612 per cent., their proportion is nearly as 2 : 5.

Mr. Wells has estimated the amount of ammonium from which the ammonium sulphate in the two samples proves to be 5.44 and 5.52 per cent., representing respectively 3.40 and 3.45 of the sulphuric acid, which, deducted from the assayed amounts of the latter, leave 3.116 and 1.566 per cent. of SO_3 in combination with alkaloids. Allowing this to be combined with cinchonia, we find the following percentage of cinchonia sulphate (which contains 10.66 per cent. SO_3) in Wells' old sample 14.69, and in his new sample 29.23 per cent., or, within a slight fraction, double the amount. The amount of alkaloidal sulphate, approximately estimated by Scheffer and Diehl by treatment with cold water, varied in four samples between 11.75 and 22 per cent. ; a variation nearly as great as found by Mr. Wells.

If the figures, as obtained by the different analysts, are averaged for the various compounds actually contained in cincho-quinine, and the ammonium sulphate be entirely omitted, a preparation closely resembling the *average* composition of the article in question, may be obtained by intimately mixing

Quinia, alkaloid,	5 grains,	or	Quinia sulphate,	7.5 grains
Quinidia, alkaloid,	15 grains,		Quinidia sulphate,	20 grains
Cinchonidia, alkaloid,	10 grains,		Cinchonidia sulphate,	12.5 grains
Cinchonia, alkaloid,	770 grains,		Cinchonia sulphate,	180 grains
Cinchonia sulphate,	200 grains,		Cinchonia, alkaloid,	780 grains
	<u>1,000 grs.</u>			<u>1,000 grs.</u>

Those who desire a still closer representation, may incorporate with either of the above mixtures 54 grains of ammonium sulphate, which will not enhance the cost, but increase the weight of this, as some medical journals tell us, *valuable nostrum*.

COMPARATIVE ANALYSIS OF CERTAIN FLUID EXTRACTS BY IODO-HYDRARGYRATE OF POTASSIUM.

BY HENRY C. SCHRANCK, PH.G.

(From an Inaugural Essay, presented to the New York College of Pharmacy.)

The writer of this essay selected the fluid extracts of nux vomica, stramonium, belladonna, conium, hyoscyamus and veratrum viride as those most suitable for his purposes, and in each case obtained original packages from the several manufacturers for the purposes of examination.

The test solutions used were as recommended by Prof. Dragendorff and Prof. F. F. Mayer, and in every case were tested, with great care, with the pure alkaloids or alkaloidal salts. The test solution which was adopted by the essayist was that of the 1-10 normal solution as suggested by Prof. Mayer, but for convenience he calls it in his essay "normal," while that which he calls 1-10 normal is really equivalent to 1-100 normal, as used by Prof. Mayer. The detailed experiments are very elaborate; in the following a brief abstract of the manipulations is given:

50 cc. of the fluid extract of *nux vomica* were evaporated to a syrupy consistence, acidulated with sulphuric acid, and while warm mixed with 50 cc. of water, then filtered to separate fatty matter and diluted to 100 cc. On testing this solution, it was observed that the final reaction with iodohydrargyrate of potassium was not sharply defined; accordingly, the fluid extract was treated as before, the solution somewhat concentrated and potassa added; after 24 hours the crystals of brucia and strychnia were collected and separated by repeated washings with warm water. On concentrating the mother lye, a further crop of crystals was obtained, the remaining alkaloids being obtained by concentrating the mother liquor, treating with sulphuric acid, filtering from resin, and again precipitating by potassa. The small amount of alkaloids, mainly strychnia, remaining in the mother waters was separately estimated by the test solution.

The fluid extract of *stramonium leaves* was acidulated, carefully evaporated, mixed with water, filtered from resinous matter, and diluted to double the original measure. The solution being too dark for correct observations, the fluid extract was precipitated by plumbic acetate, the precipitate well washed, the filtrate freed from lead by hydrogen sulphide, and the filtrate evaporated to three times the original bulk.

Another method gave the same quantitative results. The alcohol was evaporated from the fluid extract, potassa was added, and the liquid repeatedly agitated with fresh portions of chloroform; the chloroformic solution was evaporated in contact with acidulated water and filtered.

The same processes were used for the fluid extracts of *belladonna root*, *belladonna leaves* and *hyoscyamus*.

For testing the fluid extract of *conium fruit* it was found necessary to first separate resin and oil, by acidulating, evaporating, diluting with water and filtering. The filtrate was now concentrated, and the conia

removed by repeated agitation with fresh portions of ether. In one case, treatment like the extract of stramonium was found necessary in order to obtain a liquid free from turbidity.

Fluid extract of *veratrum viride* was acidulated,¹ evaporated to a syrupy consistence, diluted with water, and filtered.

This table shows the number of cc. of the test solution used to precipitate the alkaloids from 100 cc. of the various fluid extracts, the percentage amount of alkaloids in each sample, and the specific gravity of the several fluid extracts examined :

	Nux Vomica.				Stramonium.			Belladonna.		
	CC.	Strychnia.	Brucia.	Sp. Gr.	CC. used.	Atropia.	Sp. Gr.	CC. used.	Atropia.	Sp. Gr.
E. R. Squibb, M.D.	96	0.7	1.0	0.855	10.8 (seed)	0.19	0.856	12.8	0.22	1.010
Lazell, Marsh & Gardiner	80	0.56	0.9	0.968	3.0 (leaf)	0.05	1.055	20.8 (root) 13.6 (leaf)	0.37 0.24	0.953 1.023
McKesson & Robbins.....	90	0.6	0.97	1.000	2.4 (leaf)	0.04	1.060	12.0	0.21	1.091
Henry Thayer & Co.....	50	0.38	0.52	0.857	7.2 (seed)	0.12	1.029	11.2	0.2	1.082
Tilden & Co.....					8.4 (seed)	0.15	1.006	16.0 (root)	0.28	0.983
Hance Bros. & White.....	76.8	0.58	0.82	0.894	3.6 (leaf)	0.06	1.041	12.8	0.22	1.057
Burroughs Manufacturing Co					6.4 (leaf)	0.11	0.951			

	Conium.			Hyoscyamus.			Veratrum viride.		
	CC. used.	Conia.	Sp. Gr.	CC. used.	Hyoscyama.	Sp. Gr.	CC. used.	Alkaloids.	Sp. Gr.
E. R. Squibb, M.D.....	19.2	0.8	1.030	8.0	0.05	1.018	30.0	0.8	0.925
Lazell, Marsh & Gardiner.....	15.2	0.64	1.050	7.2	0.05	1.054	20.0	0.5	0.977
McKesson & Robbins.....				6.0	0.04	1.070	20.0	0.5	0.965
Henry Thayer & Co.....	8.0	0.3	1.057	4.8	0.03	1.082	12.0	0.3	1.020
Tilden & Co.....	12.0	0.5	0.997	4.2	0.02	0.976	12.8	0.34	0.883
Hance Bros. & White.....	5.3 (leaf)	0.2	1.086	5.6	0.03	1.020	18.4	0.49	0.942
Burroughs Manufacturing Company.....				4.8	0.03	0.980	20.0	0.5	0.908

¹ Jervia is precipitated from its aqueous solutions by free mineral acids.—EDITOR AMER. JOUR. PHAR.

THE CULTURE OF TOBACCO IN OHIO.

BY BENJAMIN T. CREIGHTON, PH.G.

(From an Inaugural Essay.)

The culture of tobacco, in Ohio, differs somewhat from the description given in the United States Dispensatory, this latter applying to the mode of cultivating the plant in Virginia. A large amount of the finest tobacco found in our eastern market is from the fields of Ohio, hence some knowledge of its growth may be deemed interesting.

The eastern and southeastern part of the State affords the best soil for tobacco growing, and in these districts this product has become a staple article, affording the main crop of the farmer, and, as a rule, rarely failing pecuniarily, for even in seasons when the yield is small, the price of the article is proportionately large.

In growing this much-used vegetable, the first step is the preparing of the ground for sowing the seed, by burning logs of wood or brush on the section of land chosen for tobacco beds. This is done to warm the soil, as well as to supply the ashes needed in nourishing the young plants. The burning takes place either in the fall or spring previous to sowing. If in the fall, the ground is slightly reburnt in the following spring. The time required for burning the beds, if logs of wood are used, is generally from two to three days. If brush be used, a much less time. The earth is then dug up and raked to a proper consistency. After the seeds have been deposited, the bed is thoroughly tramped or walked over, in order that it may retain sufficient moisture. In about three weeks the young plant makes its appearance, but it remains quite small for a considerable length of time, and, in fact, the growth is scarcely noticeable from the time of its appearance above ground (about the first of April,) until shortly before transplanting, which is generally about the latter part of June. It then grows with astonishing rapidity, as, when transplanted, it may have been but from 1 to 2 inches in height, when ready to collect (latter part of August) it generally measures from 3 to 6 feet, and not unfrequently 10 feet in height. The transplanting of tobacco is not unfrequently attended with much difficulty, dry weather being very detrimental to the plant, and too much moisture equally as injurious. In the former case, the young plants wilt and die, and in the latter instance, the earth becomes hardened and baked around the roots of

the vegetable, thus killing it. The ground is considered to be of the proper consistency for transplanting after it has been thoroughly moistened by rain.

Tobacco is collected from the last of August until the last of October, until frost, and, if planted late, this unwelcome visitor often finds a large crop not matured, and which is, consequently, worthless after the first touch of its icy breath. In collecting tobacco the first leaves gathered are called "bottom leaves," being from five to seven of the lower leaves of the plant, after which the plant is *topped*, thus producing larger leaves, and causing maturity in a much quicker time. This topping process strengthens the plant materially, as, after its performance, new shoots or branches will almost always spring from the axils of the leaves nearest to where the tops were broken off, and often afford leaves large enough to be gathered. The next in order are the middle leaves, which are collected in about two weeks after taking the bottom leaves; they consist of from ten to twelve leaves from the central part of the plant, and are the largest as well as the most valuable ones of the plant. Finally, the top leaves are collected, in from three to four weeks after taking the middle ones, providing there is no frost to injure them. These are smaller than the middle leaves, and resemble very much those taken from the bottom part of the plant, but are much cleaner than these latter, which often become very much soiled from their close proximity to the soil.

Among other points in cultivating tobacco, we mention the worming process, which, to most persons, is an exceedingly unpleasant task. The worm which is found on the plant is not very attractive in appearance, nor agreeable to handle. It is of a green color, and, when full size, measures about an inch in circumference and from two to three inches in length. They are very destructive, a single worm often consuming an entire plant in a few days, if unmolested. They are also found to be quite numerous, inasmuch as the tobacco has to be thoroughly cleaned of them several times during a season. To kill them, the worm is grasped with the thumb and finger by the head, and thrown, with considerable force, on the ground, which has the effect of mashing them; when agitated, while taking them from the plant, they will often eject a greenish liquid from the mouth, which is very offensive to the sight, and reminds one somewhat of the tobacco chewers of a higher order.

After collecting the tobacco, it is taken to the tobacco house, and strung upon sticks (by means of a large needle and twine), called "tobacco sticks." Women are employed for this work, who string from one hundred to one hundred and twenty-five sticks per day. It is then placed on the tobacco scaffold, in the open air, until wilted, when it is placed in the "tobacco house," where a gradual heat is applied until it assumes a yellow color. A higher degree of heat is then immediately applied, for twenty-four hours, to "kill it," as the farmer terms it, meaning the expulsion of all moisture from the leaves. The doors of the house are then thrown open, and the floor often sprinkled with water, in order that the leaves may again become sufficiently moistened to permit manipulation. It is now rolled in bundles ready for market.

The main object sought for by tobacco growers is the color, which is influenced by various causes, among the leading ones are the modes of drying and the soil upon which it was raised, as the first crop of tobacco on any soil is invariably the finest. The "yellow spangle" is considered the finest color, and, consequently, brings the highest price. The "light red" also stands high in the list, and is deemed a valuable color. There are several other colors beside the two named which go to make up the tobacco seen in commerce.

Ashes.—After careful experiments with an extra fine quality of tobacco, furnished by an Ohio grower, the following results have been obtained, being the relative per cent. yielded by bottom, middle and top leaves:

Bottom leaves 18.4, middle leaves 14.2, top leaves 14.8 per cent.

In obtaining these results, the tobacco was dried by means of heat until it ceased to lose weight, one thousand grains were then weighed out and subjected to smothered combustion, until charred, after which they were completely incinerated, and the product again weighed, yielding, respectively, 184, 142 and 148 grains of ashes.

These amounts are much smaller than obtained by other experimenters, and I can only attribute the different results to the following, namely: The bottom leaves of tobacco invariably grow on or near the ground, and, tobacco being of a very glutinous nature, become strongly impregnated with the soil. This foreign matter adheres so tenaciously to the leaves that it cannot all be removed, nor can it be recognized with the naked eye. In view of this fact, it is but fair to

suppose that the large amount of ashes which some have obtained may have been due, in part, at least, to the bottom leaves having been used in their experiments.

TOBACCO CULTURE IN PENNSYLVANIA.

BY JOHN ALFRED WITMER, PH.G.

(*Abstract from an Inaugural Essay.*)

The cultivation of tobacco was not carried on to any great extent in Pennsylvania previous to the late civil war; since that time it has increased very considerably. The author's personal acquaintance with the culture of this commodity is limited to Lancaster county, Pa.

The seeds which have been collected the previous autumn are sown (in early spring) in cold frames. These frames consist of large oblong boxes, without bottoms, two or two and a half feet deep by three feet wide, and covered with glass. They are prepared in autumn by being filled with rich earth and fertilizers. In selecting a site for these frames, a sheltered spot having a southern exposure is preferred. They are additionally protected from the weather by being covered with straw, &c. Persons making "plant-raising" a specialty, sow as early as the 15th of February. After sowing, the frames are covered with glass alone during the day, and sheltered at night. The earth being kept moist, the seeds soon sprout, and the little plants appear. Additional care must now be taken to admit the sun during the day and to protect from the frosts at night. Persons not desirous of having plants early or for sale do not take the precautions above enumerated, nor do they sow as early. A warm, sunny spot, having a rich soil, or one enriched by fertilizers, is sufficient for their purposes. When quite young, the plants are frequently infested by the "plant-louse," an insect belonging to the genus "Aphis." When the plants have attained the height of several inches, they are transplanted to the fields. This is rarely done before the 15th of May to the 1st of June. The fields are plowed the previous autumn, as by so doing it is thought that some of the insect enemies are destroyed. In the spring the soil is loosened, and then plowed in such a manner as to form ridges one-half to one foot high, at a distance of four to five feet apart. The plants are planted on the tops of these ridges, at a distance of two to three feet. A wet day is chosen, as the plants require much moisture to continue

their growth without interruption, for at best a large percentage die, owing to want of sufficient care in planting or the ravages of the "cutworm" (different species of the genera *Agrotis*, *Gortyna*, &c.), which is the principal enemy at this period of its growth. They are concealed in the earth during the day, and go on their errands of destruction at night, cutting off the plant while it is young and succulent. The only means of preventing the ravages of this enemy is to seek for him in his hiding-place, and when found kill him. These belong to the order *Lepidoptera*, or scale-winged insects.

After the plants have been thoroughly rooted, one of the principal objects is to keep down the weeds, which grow luxuriantly in the rich soil. This is accomplished by hoe-harrowing and the hand hoe until the plant grows too large to admit the passage of a horse and harrow without injury to the leaves, after which the plant is strong enough to suppress the weeds, when it grows very rapidly, soon attains the height of three or four feet, and puts forth the flowering head. This is broken off when leaves are the object of the cultivator, but when seeds are desired, the inflorescence is left to develop. Cultivators differ as to the proper time to *top* or break off the flower-head; some prefer to top when the stem has six or eight leaves, while others think ten not too many. After being topped, axillary branches are put forth, which are popularly known as "suckers." These are broken off as soon and as often as they appear. The whole plant is now covered by a viscid, resinous substance, commonly called "gum," which renders it very unpleasant to handle.

About this time tobacco's greatest enemy makes its appearance, namely, the "tobacco-worm" (*Sphinx Carolina*, Linn., different species of genus *Macrosilla* and others). This, the larva of the "grey American hawk moth," is a green worm, sometimes as large as a man's finger. Allied to this is the *Sphinx quinquemaculata*, of Stevens (also referred to *Macrosilla*), the larva of which sometimes infests tobacco, but more frequently the tomato and potato. These moths hide themselves and sleep during the day, and at night they go forth to deposit their eggs, in patches of six or more, on the leaves. During the early hours of summer evenings they may be seen hovering over the flowers of the "Jamestown weed" (*Datura stramonium*), from which they extract the exuding juice. By the introduction of some virulent poison into these flowers, numbers of them might be destroyed. These,

also, belong to the order Lepidoptera. The larvæ are very destructive to the leaves, and I have known instances in which one worm has eaten an entire plant in a single night. They are watched very closely, picked off by hand, and destroyed.

Of late years a very destructive enemy, in different species of "Arma" (*Arma modesta*, *macula*, &c.), has been noticed. These belong to the order Hemiptera, or half-winged insects, and deposit their eggs in patches of thirty to fifty. When the young are hatched, they puncture the leaves, and suck the juices of the plant. When a leaf has been punctured by these insects, it rapidly withers, and presents the appearance of having been scalded. As yet no practical method has been adopted for the destruction of this enemy.

When tobacco is *ripe*, or fit to cut, it assumes a peculiar yellowish-green color, and when the under side of the leaf is bent it is brittle, and breaks easily. When in proper condition to be gathered, it is cut off close to the ground, and hung up to dry. Various methods have been proposed for hanging it up, but the most approved, and the one generally adopted, is to pierce the base of the stem by a steel spear, in which is fitted an ordinary plastering lath. By this means five or six stalks are slipped on one lath, and handled and hung up as easily as one. The largest growers have sheds built purposely for drying and curing. These are closed in by alternate boards hung on hinges, so that they may be opened for the free circulation of air on favorable days. Tobacco, when dried and cured, is of a brownish-yellow color, very crisp and brittle, and easily broken when handled, but when moistened it becomes quite pliable.

After the 1st of December the tobacco is "stripped." By this is meant the separation of the leaves from the stems. They are then assorted into two grades, viz., "fillers" and "wrappers." The former consists of "ground" leaves, and those which have been torn or worm-eaten; the latter, wholly of fine, perfect leaves. These names are derived from the relative positions the grades take in cigars. The different grades are then bound into small bundles, by wrapping one leaf around the bases of a dozen others. After being pressed in cases it is ready for market. The term "stripping," as applied by the cultivator, should not be confounded with the same term used by the manufacturer, which refers to the separation of the midrib from the leaf.

ANALYSIS OF SPIRITUS ÆTHERIS NITROSI.

BY GEORGE W. KENNEDY, PH.G.

Within the last decade, or since I first began to take an interest in pharmacy, numerous complaints have been made by pharmacists as to the quality of spirit of nitrous ether, as furnished by manufacturing chemists, and also that which is found in the market, and represented to be made by reliable manufacturers. Some of the many complaints are that the preparation is deficient in nitrous ether, and that it contains too much water, besides acetic and nitrogen acids, aldehyd and ethyl chloride. My first attempt towards examining commercial spirit of nitre was made about a year or two ago, after having purchased a small quantity from a wholesale drug house in New York city, which I considered enjoyed an excellent reputation, and from which I thought pure and unadulterated preparations could be obtained. My attention was directed to the color and odor of the article; it was almost colorless, and comparatively destitute of the nitrous ether odor characteristic of the preparation. Pure nitrous ether is of a decidedly yellow color, and, as spirit of nitre contains between four and five per cent. of it, the officinal spirit must necessarily have a yellowish color. Although exposure to light would soon make it colorless, I am under the impression such was not the case with the preparation just alluded to, as, upon examination, it was found to contain but 1.8 per cent. of ordinary ethyl nitrite, and its specific gravity was but 0.920, indicating a large addition of water. The writer would here take the liberty to suggest to the readers of the "Journal" that it is absolutely necessary that some change should be made in the preservation of this highly important and valuable preparation. Those pharmacists who manufacture it themselves, I take for granted, know why it should be excluded from light and air, and kept only in small bottles.

The blame cannot and should not always be placed on the manufacturing chemists, of putting a worthless article of this kind in the market, as, by the writer's analysis of some of the more prominent brands, it will be observed that one of them was in excellent state of preservation, while some of the others bear a good examination, and are thus out of the reach of critics. That obtained from retail sources, and procured from pharmacists living in my vicinity, was, in the majority of cases, entirely unfit for use, and should not be dispensed as a medicine. This would seem to reflect on the probity of some of our wholesale and retail dealers where the sophistication was made. Which

of the two would be guilty of such an ignominious transaction I am not prepared to say, as all the nitre that I examined was obtained from retail druggists, with the exception of those marked otherwise.

It is greatly to be regretted by all those interested in the promotion of the science of pharmacy that so many incompetent or unskilled persons are allowed to practice it. By way of exemplification, I desire to give the readers some idea of a class of druggists that the pharmacists in this country have to contend with. In conversation with a druggist on the above subject, he laughed at the idea of a pharmacist offering for sale spirit of nitrous ether. "Why," said he, "I sell the pure nitrous ether itself, and it is the only thing that should be sold when spt. nit. æth. is called for." A friend of mine, representing a wholesale drug house, from Philadelphia, informs me that he called on a druggist for the purpose of selling him a bill of goods. It was about the time the new "*Pharmacopœia*" was published. He asked the druggist if he did not want one. The druggist wanted to know what it was; thought it was some new medicine or quack nostrum, and refused purchasing for those reasons. When informed that it was a book of great value to druggists, and that it should be in possession of every one, his reply was that he could get along without so many books.

I must not get off my subject; but I simply referred to this class of druggists to show the necessity of reform, and of having none but qualified and competent pharmacists. I am satisfied, if we had a more intelligent body of pharmacists, spirit of nitrous ether could be obtained of a far superior quality, as considerable of it spoils owing to the insecure condition in which it is kept; and of course the same will apply to almost any other drug. I know of a retail druggist who buys spirit of nitre by the carboy, and, not knowing the injurious and destructive influence of atmospheric air and moisture, takes no pains to see that the carboy is securely stoppered, but simply drops the stopper loosely into the neck of the carboy, and allows it so to remain. In justice to the pharmacist, and more especially to the patient and physician, manufacturers should not fill it in carboys, but in half-pound or pound bottles, similar in style to that in which Dr. Squibb puts it up. From my investigations I would come to the conclusion that it would be advisable for pharmacists to make their own nitre; prepare it in small quantities, as wanted, and see that it is well preserved. Recently, I have been making all I needed, and find it economical as well as a

pleasure, with the satisfaction, in addition, to know that it thoroughly represents the article required by the "Pharmacopœia." The official process is simple, the directions explicit, and the expense but trifling in purchasing a Liebig's condenser, a retort and thermometer—all the apparatus required.

Table giving the Results.

Made by or obtained from.	Specific Gravity.	Per cent. of Ethyl Nitric.	When treated with Sodium Bicarbonate.	When treated with Solution of Potassa for Aldehyd.	Nitrogen Acids as shown by Paper dipped in Tinct. Guaiac.	Nitrogen Acids as shown when treated with Sulph. of Iron and Sulph. Acid.	Ethyl Chloride treated with Nitric Acid & Nitrate of Silver.	Action on Litmus Paper.	Color.
1 E. R. Squibb.....	0.838	4.6	No effervescence perceptible	No deposit, light red solution	Faint blue color produced	No change noticeable	None	Light red	Pale yellow
2 Powers & Weightman.....	0.840	4.1	Slight effervescence produced	No deposit, red solution	A decided blue color	Light olive	A trace	Red	"
3 Rosengarten & Sons	0.839	4.2	"	"	"	"	"	"	"
4 Retail store.....	0.902	3.2	Effervescence quite active	Heavy deposit, dark red solution	Dark blue color	Dark olive color	Light deposit	Active	Almost colorless
5 " "	0.850	3.5	Effervescences slowly	Light deposit, red solution	"	Pale olive color	A trace	"	Light yellow
6 " "	0.910	3.1	Effervescences briskly	"	"	Dark olive color	"	"	Very "
7 Made in New York, sold in town.....	0.907	2.9	"	Heavy deposit, dark solution	"	"	.....	"	Almost colorless
8 Retail store	0.860	3.9	Very slight effervescence perceptible.	No deposit, light red solution	Blue color	Light olive color	A trace	Light red	Pale yellow
9 " "	0.841	4.0	"	"	"	"	.....	"	"
10 Freshly made by the writer.....	0.835	4.5	No effervescence	No deposit, light red solution	Light blue color	No change	.....	"	"

The last examined was prepared by the writer, and was examined shortly after it was made.

Pottsville, Pa., May 2d, 1876.

EXTRACT OF JALAP.

BY G. H. CHARLES KLIE.

The formula of the "U. S. Pharmacopœia" for the preparation of the extract of jalap is :

Take of Jalap, in moderately fine powder, 12 Troyounces,
Alcohol, 4 pints,
Water, a sufficient quantity.

Introduce the powder, previously mixed with 3 fluidounces of alcohol into a conical percolator, and gradually pour upon it the remainder of the alcohol. When the liquid ceases to pass, pour sufficient water upon the residue to keep its surface covered, until 4 pints of tincture have passed. Set this portion aside, and continue the percolation until 6 pints of infusion have been obtained. Distill off the alcohol from the tincture, and evaporate the infusion until the liquids respectively have been brought to the consistence of thin honey ; then mix them, and evaporate them to the proper consistence.

The expression, "*introduce into a percolator*," is rather indefinite. It leaves the operator to guess whether to use light, heavy or no pressure at all. I find, that in the first part of the process, where the jalap is exhausted with alcohol, no matter how firm it is packed, the alcohol will pass freely, and without difficulty. The trouble commences when the water is poured on. According to how the powder was pressed in the percolator, the water will penetrate ; if firmly, very slow ; and when it has penetrated two-thirds, which takes about ten days, it is so overcharged with extract that it will not advance perceptibly. When the powder is loosely packed, the water penetrates somewhat faster ; but, when two-thirds of the mass is penetrated, the same difficulty occurs. The line between the alcoholic tincture and water is well defined—the latter in its descent becoming charged with extract, assumes a dark-brown, almost black color. If the apparatus is now left to itself, it may stand months, and still percolation will not be finished. To accelerate the process, I found the following to be about the best method : I poured water on the powder until it stood above the latter five inches, and then, at intervals, stirred the mass down to the line of separation. The stirring re-incorporates the thick, viscid, dark-colored line of separation, and gives the thinned liquid a better chance to penetrate. By this mode the alcoholic tincture was driven out in a comparatively short time. The tincture measured 3 pints and 14 fluid-

ounces, showing a loss of 2 fluidounces. The process was conducted in a common $\frac{1}{2}$ gal. glass percolator, without air-tight lid. The orifice of the percolator was then closed, the mass well stirred, and poured on a star filter. Gradually pouring water on the filter, after twelve hours, 4 pints of infusion had been obtained, and the jalap was almost exhausted, at least so much so, that the additional extract to be gained would not compensate further percolation and cost of subsequent evaporation. After concentration and evaporation to the proper consistence, the product was found to weigh $6\frac{1}{2}$ ounces—being* 54 per cent. of the jalap employed.

To see whether percolation by water would proceed more favorably with coarse powder, since moderately fine powder, as seen above, whether firmly or loosely packed, or only loosely placed in the percolator, when left undisturbed would not let the water pass; I took one pound of jalap root, ground so as to pass through a sieve of sixteen meshes to the linear inch, moistened it with 4 fluidounces of alcohol, and packed it very tight in an air-tight glass percolator, and poured on alcohol gradually, until 4 pints had been used. From the use of this quantity of alcohol the jalap seemed to be exhausted; water was then poured on, and it took about an hour to displace the remaining alcoholic tincture. The tincture measured 3 pints, $15\frac{1}{2}$ fluidounces, showing that only $\frac{1}{2}$ fluidounce of alcohol had been lost. The dark line between the alcoholic tincture and the water could not be well discerned until the latter had penetrated very near to the bottom. As already mentioned, it took an hour for the water to penetrate the jalap. Dropping was at first slow—the infusion being thick like honey—but, by-and-by, it got thinned, and the drops fell faster. When 2 pints of infusion had been obtained, percolation ceased altogether,—the powder in the percolator having in the mean time swollen to two and a half times its original bulk, and would not let any more water pass. The respective liquids were evaporated, mixed, brought to the proper consistence, and the product was found to weigh 7 ounces, or 43.75 per cent. of the root employed.

There is another method for preparing the extract, obviating the drying and the very disagreeable work of powdering the root. It is: To place the whole root in a vessel with a perforated bottom, and to suspend it in a vessel of water in such a manner that all of the root will be immersed in it. The heavy infusion will sink to the bottom,

and, after some time, all of the water will be saturated, whereupon, the root must be suspended in a fresh quantity of menstruum, and this repeated until it is exhausted. Now the root is superficially dried, pounded into a fine mass, packed moderately firm in a percolator, and displaced with alcohol. For one pound of root 4 pints of alcohol will be found amply sufficient. When percolation ceases, the alcoholic tincture remaining in the mass is displaced by water, which only takes a short time. The yield by this process was found to be 9 ounces of extract from one pound of root, or 56 per cent.

Passing the three different methods in review, the conclusion is arrived at, that, although the product by the first process is satisfactory in amount, still the last mentioned is superior on account of the greatest yield of extract, and the least difficulty in handling the ingredients.

There is one fact in regard to extract of jalap to which I wish to draw particular attention, viz.: the great difference in the price between it and the root. The former is quoted at from \$4.50 to \$5.00, and the latter can be bought for \$0.30 a pound. If it is taken into consideration, that from two pounds of the root one pound of extract is easily obtained—the disproportion in price is at once apparent. The following accounts will explain this more minutely: In account No. 1, 7 pints of alcohol is regained by distillation; in No. 2, all the alcohol is lost by evaporation.

No. I.	
Wholesale price of one pound of extract,	\$4.50
<i>Cost of Material.</i>	
2 lbs. Jalap root, @ \$0.30, \$0.60	
1 pt. lost alcohol, @ \$2.30, . 0.28½	
Fire, . . . . .	.15
Total,	<u>\$1.03½</u>
Difference,	<u>\$3.46½</u>

No. II.	
Wholesale price of one pound of extract,	\$4.50
<i>Cost of Material.</i>	
2 lbs. Jalap root, @ \$0.30, . \$0.60	
1 gal. alcohol,	2.30
Fire cost of . . . . .	.15
Total,	<u>\$3.05</u>
Leaves difference,	<u>\$1.45</u>

The above shows that when the alcohol is regained by distillation, one pound of extract can be made for \$1.03½, and, when it is lost, for \$3.05, leaving in the former case \$3.40½, and in the latter \$1.45 net profit, as compared with the wholesale price.

Lowell, N. St. Louis, Mo.

REMARKS ON EXTRACT OF JALAP.

BY JOHN M. MAISCH.

The preceding valuable and practical paper, by Mr. Klie, suggests some remarks on the necessity of modifying the officinal process on the occasion of the next revision of the "Pharmacopœia."

Pereira, in commenting upon the process of the former "London Pharmacopœia," after which that of the "U. S. Pharmacopœia" was modeled, states: "It was, formerly, and, indeed, is now, by many persons, supposed that the combination of these ingredients (*i. e.*, the resin and gummy extractive,) was necessary for the full cathartic effect of jalap. It is, however, well known that the watery extract is inert as a purgative, though it is said to be diuretic; the only advantage, therefore, that can attend the mixture of the two extracts (the watery and the alcoholic) is that the resin is intimately divided, and thereby prevented from causing violent irritation and griping in any one part of the intestinal tube. But it is obvious that the same advantage can be obtained by mixing the resin with some mild agent (as almonds, sugar or saline matter)."

In 1864, Mr. Alfred B. Taylor reported to the American Pharmaceutical Association the result of some experiments (see "Am. Jour. Phar.," 1865, p. 219), according to which the aqueous extract, obtained from jalap, previously exhausted by alcohol, is without any laxative or diuretic effect.

Most of the Pharmacopœias of continental Europe have long since (some for more than fifty years) discarded the *extract* and introduced in its place the *resin* of jalap. The few Pharmacopœias in which an extract of jalap is still officinal, prepare it (we believe with the sole exception of the U. S. and British Pharmacopœias) similar to the French codex, by exhausting the powdered root with alcohol, and evaporating the tincture. Thus prepared, the extract of jalap is *nearly* identical with the resin, or rather it consists of resin with a comparatively small quantity of matter soluble in water, amounting, in all, to perhaps ten per cent. of its weight. In this portion will be found, besides some sugar, a body having some resemblance to resin, but differing from this class of bodies by being soluble in water. It is not unlikely that to this principle must be ascribed the mild purgative and diuretic properties, which, according to some old works on *Materia Medica*, are ascribed to the aqueous extract.

Some eight or ten years ago the writer, while preparing a larger quantity of the resin, by the officinal process, saved the washings, and, by evaporation, obtained an extract, which was employed by several physicians, and found to possess some advantage as a mild laxative, more particularly applicable for children and feeble adults. Whether these properties are of sufficient importance to warrant retaining as officinal, an extract *and* resin of jalap, remains to be determined by further investigations, to which we would herewith direct the attention of the readers of the "Journal." But the point appears to be well settled that the gummy extract obtained from jalap, by water, after previous exhaustion by alcohol, is destitute of medicinal properties, and should be omitted in the next revision of the "Pharmacopœia."

. (" *This prescription must not be renewed.*")

A SUGGESTION TO PHYSICIANS.

BY HANS M. WILDER.

The above words (or something of similar import) are familiar to every dispenser, and are to be found printed on nearly every kind of prescription blanks. I would respectfully suggest that said words be *written* every time when found necessary, in order to save the dispenser a great deal of trouble.

The trouble comes in this way: Suppose a physician prescribes a very active preparation (and perhaps in an unusual dose) which he does not wish to be renewed; he relies on the *printed* formula and on the dispenser's common sense.

Suppose, further, that said medicine has done the patient a great deal of good, and he wants it made over again, he comes again himself or sends somebody to the drug-store. There now ensues a conversation somewhat in the following fashion:

The dispenser expresses his regret that he cannot comply with the wish of the patient; but the physician does not want it done.

"How do you know?"

"Why, you see here, this prescription must not be renewed."

"Well, but that means nothing, I am sure. You see it is *printed*, and will, of course, apply to everything written on the prescription paper. Suppose the doctor had prescribed sweet spirits of nitre, for instance, you could surely not refuse to renew that."

The dispenser admits this point, but still refuses to renew the prescription, and tries everything to convince the customer that he is bound not to do it. All the thanks he gets for his pains are something like the following :

" I must tell you, sir, that you are a very disobliging man. I shall *never* come to you again !" Exit.

If, now, the physician had *written* said words, the customer would have been able to understand that the dispenser did but his duty when he refused to renew the medicine.

A WAFER MACHINE AND PRESS.

BY WILLIAM MCINTYRE, PH.G.

(*Read at the Pharmaceutical Meeting held May 23d.*)

Numerous writers have advocated the advantages of wafer capsules, and while doing this, have condemned those of American manufacture ; the objection urged is their appearance, it being not denied that they are quite as suitable for the intended purpose as the imported article.

The apparatus exhibited herewith presents in a compact form all that is required to manufacture from wafer sheets, concave wafer discs and a press to seal them for use. It consists of two metallic dies of the same size, one of which has one of its faces turned to the proper concave form ; the other has a corresponding convex face, and on the opposite side a hole is bored to allow of the insertion of a wooden handle. These dies are moderately heated, a flat wafer disc is inserted and pressure applied for a moment, when upon separation of the dies, the disc will be found to have the desired shape.

The flat discs are cut from sheet wafers by a punch similar to a cork borer—the other end of which is arranged so as to form the wetter.

The addition of a duplicate concave die will furnish the press, and complete the apparatus.

THE PHARMACEUTICAL VALUE OF SUGAR OF MILK.

BY WALTER E. BIBBY, PH.G.

(*Read at the Pharmaceutical Meeting, held May 23d.*)

At the Pharmaceutical Meeting, held in the College hall on the 21st of March, Mr. J. C. Biddle recommended the incorporation of

sugar of milk with powdered squill, in order to prevent caking. This led me to believe that this substance could be used to attain the same effect in a large number of the gum resins that are often required in the state of powder, and which cannot be reduced unless previously heated, which process is very liable to endanger or completely subvert the therapeutical value; or, if powdered by any other means, it fails to reach the wants of the pharmacist, by reason that the state of powder is merely temporary. Belonging to this class of substances are ammoniac, assafoetida, galbanum, guaiac, myrrh and a large number of others.

Now, to preserve these substances in the state of fine powder, and in a condition that they may be dispensed on the prescriptions of physicians in a thoroughly pharmaceutical manner, I would recommend that sugar of milk be added and triturated in the proportion of either three parts of the gum resin to one of sugar of milk, or of two of the former to one of the latter,—the powder to be preserved in well-stoppered bottles.

For guaiac resin and squill, I use 90 parts to 10 of sugar of milk. It may be well to state, that the cooler the weather the less time is required for trituration. To preserve camphor in a form of powder, I find sugar of milk answers better than any other substance that has been recommended. Below is given the quantity of sugar of milk required:

Take of camphor,	. . . . .	90 grains.
alcohol,	. . . . .	30 drops.
sugar of milk,	. . . . .	10 grains.

Rub the camphor first with the alcohol, until reduced to a fine powder, then with the sugar of milk.

The sample on the table was powdered in this manner, about two months ago.

At the suggestion of Prof. John M. Maisch, I was induced to try sugar of milk in preparing mercurial pill and mercury with chalk, which two preparations are very seldom manufactured by the apothecary, for the reason, of the great difficulty encountered in extinguishing the mercury. In preparing blue pill, I find, to my entire satisfaction, by substituting sugar of milk for powdered liquorice root, and with a slight modification of the officinal process, this difficulty can be readily overcome. I recommend the following process for

Pilula Hydrargyri: Take of mercury,
confection of rose,
sugar of milk, $\text{aa } \text{ʒi}$

Rub the mercury with the confection of rose and sugar of milk, until metallic globules are no longer visible.

Blue mass, prepared in this manner, has about the same pilular consistence as when prepared by the formula of the "U. S. Pharmacopœia." The blue pill is often wanted in the state of powder; this has led to quite a number of suggestions. Some have recommended rubbing together mercury with honey, until globules of mercury cease to be visible, and then incorporating other ingredients, the whole to be set aside in a warm place to dry, and then reduced to powder. Others recommend rubbing the mercury with syrup and sugar, and dry by the aid of heat. I may here state that both of these processes are exceedingly objectionable, as when heat is employed or when left in contact with the air, the mercury becomes oxidized, and renders the preparation entirely too active. Also when honey or sugar are employed, the preparation is liable to attract moisture from the atmosphere, which causes it to cake together and become hard.

To remedy this, and at the same time produce a perfect division of the mercury, I would suggest the following method for making

Pulvis Pil: Hydrargyri.—Take of mercury, ʒi
sugar of milk, ʒii

Triturate the mixture thoroughly until the powder will pass through a fine sieve, or fine bolting cloth.

Prepared in this manner, powdered blue mass is a light-grayish powder, and incapable of attracting moisture; and so thoroughly is the minute state of division, that globules of mercury cannot be seen with the aid of a lens. This preparation is also well suited for conversion into the pilular form.

Mercury with chalk, made according to the formula in the "U. S. Pharmacopœia," does not come up to the wants of the physician, on account of the imperfect division of the mercury; and, owing to this fact, it has fallen considerable into disuse. After trying various means, none answered so well and was as convenient as sugar of milk. I prepare it in the following manner:

Hydrargrum cum Cretâ: Take of Mercury, ʒiii
Prepared chalk, ʒiv
Sugar of milk, ʒi

Rub the mercury, prepared chalk and sugar of milk into an impalpable powder, and pass it through a fine sieve.

The above formula, although not containing the same amount of prepared chalk, contains the metallic mercury in the same proportion (3 in 8) as called for in the "U. S. Pharmacopœia," and I think is more efficacious as a remedy, as the mercury is more thoroughly divided.

In the above, I state the result of my manipulations with sugar of milk and those substances that are required to be in a very minute state of division ; and I feel confident that those who will employ this substance in the manner and for the purpose I have described, cannot fail to acknowledge that sugar of milk is preferable to all other substances. Being perfectly harmless, of a hard, gritty nature, and chemically a perfectly definite material, I feel certain that it will supercede the old practice of employing heat in powdering the gum resins. Moreover, in dispensing emulsions, sugar of milk materially assists in the formation of a perfect emulsion, by reason of the minute state of division of the gum resin, induced by the trituration of sugar of milk with the drug.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

The Decomposition of White Precipitate by Iodine, Chlorine and Bromine.
—V. Schwarzenbach has observed that iodine may be triturated with white precipitate, or heated with it in a crucible, without any other result being observed, especially in the latter case, than the formation of beautiful red crystals of mercuric iodide. But, if alcohol be added to the mixture, in an open vessel, after some time (about 35 minutes) a smart explosion takes place, which inevitably destroys the vessel, if it be of glass, but only to the exact height reached by the surface of the liquid. Up to the time of explosion no rise in temperature was observed, and the inserted thermometer remained uninjured when the vessel was destroyed. In direct sunlight, the explosion followed more rapidly, frequently in 9 or 10 minutes. Among the products, scattered by the explosion, were red mercuric iodide, and strongly detonating particles of nitrogen iodide of considerable size ; the gas evolved was identified as nitrogen. If chloroform or amyl alcohol are used, instead of ethylic alcohol, and the iodine is increased to six atoms for two molecules of white precipitate, strong detonations occur in the liquid.

When powdered white precipitate is dropped into an open flask, filled with chlorine, it becomes strongly heated, after a few minutes, and assumes an appearance of ebullition, followed either by an explosion or, more frequently, by the appearance of a greenish flame, free nitrogen, nitrogen chloride and mercuric chloride being formed.

The action of bromine, upon white precipitate, was found to be very analogous to the foregoing.—*Pharm. Jour. and Trans.*, 1876, March 11, from *Ber. D. Chem. Ges.*, vol. viii.

Mr. Charles Rice, having observed detonations occurring while triturating white precipitate with tincture of iodine, reports, in "New Remedies," for February, that the addition of carbolic acid prevents the explosion and generates some iodoform, equal to about two per cent. of the iodine employed. Without alcohol, iodine and white precipitate produce no iodide of nitrogen, nor does a solution of iodine in carbolic acid, without alcohol, produce iodoform. The investigations were instituted on noticing that, while making an ointment composed of Tinct. iodinii ʒss. Hydrarg. ammon. gr.ii, and Ung. acidi carbol. ʒi, a sudden fading of color took place, and the resulting ointment was entirely white.

An assay of persian opium was recently made by W. D. Howard; it had been sent to England as "perfectly pure," and yielded, not previously dried: morphia, crystallized from alcohol, 10.40; codeia (anhydrous), 0.29; narcotina, 2.50; thebaina, 0.57; cryptopia, 0.09 per cent., and a trace of papaverina.—*Pharm. Jour. and Trans.*, 1876, March 11.

Impure Potassium Iodide.—Thos. F. Best has found, in five samples, the following excess of alkali, consisting chiefly of carbonate: 5.44, 5.35, 2.32, 1.78 and 0.53 per cent. Commercially pure iodide should not contain more than from 0.15 to 0.20 per cent.—*Ibid.*

Detection of Free Mineral Acids in Vinegar.—Witz has proposed methylanilin-violet for this purpose. A. Hilger, in experimenting with it, observed that pure vinegar does not affect the color, but on the addition of sulphuric acid the color is changed, with one-fifth per cent. to blue, with one-half per cent. to blue-green, and with one per cent. green. Similar changes occur with muriatic acid, one-tenth per cent. producing a blue, one-fifth per cent. a green color, and with one per cent. the color disappears. Much smaller quantities of free min-

eral acids may, however, be detected by evaporating the vinegar, with some of the violet, to a small bulk.

The color solution was made by dissolving 0.01 grm. methylanilin-violet in 100 grm. of water, and 2 to 3 drops of this solution are used for 25 cc. of vinegar. The method is not applicable for the quantitative determination of the free mineral acids, the change to violet, on neutralizing with alkali, occurring gradually.—*Archiv d. Pharm.*, 1876, March, 193-196.

Chloral-Chloroform, which was, several years ago (see "*Am. Jour. Pharm.*," 1870, p. 319 and 409; 1871, p. 410), recommended as being preferable to ordinarily prepared chloroform, on account of its not being decomposed by light, has again been examined by Dr. Schacht, and found to alter in the light as rapidly as the latter, unless preserved by the addition of a little alcohol.—*Pharm. Zeit.*, No. 26.

The quantitative separation of morphia from sugar cannot be effected by the processes recommended for the quantitative estimation of that alkaloid. Dr. Schacht has made numerous experiments on this subject, and is continuing his investigations.—*Ibid.*

Butyl chloral.—Dr. Oscar Liebreich states that Krämer and Pinner have ascertained that the substance commonly called *croton-chloral* contains 2H more than was supposed, and is, in fact, butyl-chloral. Soda decomposes it, forming chloride and formiate of sodium, and bichlorallylene. According to Liebreich, chloral causes death by interfering with the cardiac ganglia; butyl-chloral, by its action on the respiratory centre. With the latter, anæsthesia commences at the head, while reflex action can still be excited on the limbs. Doses of butyl-chloral, sufficient merely to produce anæsthesia of the head, do not essentially affect the pulse and respiration. In insane adults, 5 grams were found to produce sleep and anæsthesia of the head, with maintenance of the muscular tonus, and of reflex action in the trunk, so that the patients remained sitting, while the head was perfectly anæsthetic.

Liebreich orders it in the following form: butyl-chloral hydrate, 5 to 10 parts; glycerin, 20 parts; distilled water, 130 grams; the mixture to be shaken before being used. The dose is half an ounce, to be followed, in five minutes, by a second, and, in ten minutes, by a third. It is well to commence with a small dose, to avoid producing

hypnotism, where the anæsthetic effect alone is desired. To produce sleep, one, two or three grams, according to the patient's constitution, are to be given at bed-time.—*Pharm. Jour. and Trans.*, 1876, February 19.

Myrrh, according to W. Dymock, comes to Bombay from Berbera, where it is purchased by agents residing at Aden or Makulla. The bags or bales, when opened in Bombay, are found to be made up of, 1, a large proportion of roundish masses of fine myrrh; 2, a considerable proportion of small semi-transparent pieces of myrrh, of irregular shape; 3, numerous pieces of dark-colored myrrh, mixed with bark and other refuse; 4, a small proportion of an opaque gum resin (*Bdellium opaque*, of Guibourt?); occasionally small pieces of resin (juniper?) are also met with. The contents are sorted, the best myrrh going to Europe, the darker pieces forming a second quality, and the refuse being exported to China, where it is probably used as incense. True myrrh is known in the local market as *käräm*, the opaque bdellium as *meena härma*. The latter is used for the extraction of the Guinea worm; it resembles ammoniacum; is yellowish-white and bitter, with hardly any odor.

The Arabian myrrh of the "Pharmacographia" is received from Makulla and Aden, and is known as *meetiga*; no true myrrh is ever received from Arabia.

Bdellium comes also from Berbera. Besides the ordinary bdellium, the bales contain a small quantity of a perfumed kind, occurring in irregularly shaped pieces, more or less flat, some of them having fragments of thick bark adhering. The color of the gum is dark reddish-brown, but opaque yellowish-white streaks are frequently met with in the semi-transparent mass. The odor, on fresh fracture, is powerful and pleasant, not unlike a lemon lollipop. The Arabic name is *häbäk hädee*.

Indian bdellium comes chiefly from Deccan; in form and appearance it resembles the African drug, the pieces often having pieces of a papery bark attached to them; but the color is greenish, and the odor, though similar, is more faint. Its value is one-third less than the African bdellium.—*Pharm. Jour. and Trans.*, 1876, Feb. 19.

Damiana.—The three varieties of *Damiana* ("Amer. Jour. Pharm.," 1875, p. 518) have been examined, as to their botanical origin, by Mr.

E. M. Holmes. That of Helwick & Co. comes from a plant of the genus *Turnera*, nat. order *Turneraceæ*, allied to *Turnera microphylla*, D. C. The San Francisco damiana appears to be a hairy variety of the same plant, and has a taste recalling that of confection of senna (not sage-like, as stated on page 519 of last volume). The third kind of damiana is the *Aplopappus* (now called *Haplopappus*) *discoideus*, D. C., the leaves of which taste like sage.—*Pharm. Jour. and Trans.*, 1876, Jan. 22.

Dr. J. T. Rothrock, of Wilkesbarre, Pa., published a paper on the last mentioned variety of damiana in the "Phila. Med. and Surg. Reporter," March 4. He arrived at the same conclusion, and gives the following synonyms for the plant: *Linosyris mexicana*, Schlechtendal; *Baccharis veneta*, Humboldt, Bonpland and Kunth, and *Bigelevia veneta*, Gray. It is a common plant in Mexico, and another closely allied species, which by some is considered identical with the preceding *Bigelevia Menziesii*, Gray, is found in California and Arizona. Prof. Gray has confirmed these conclusions.

NOTES ON THE INTERNATIONAL EXPOSITION.

BY THE EDITOR.

The International Exposition in Philadelphia, which was formally opened by the President of the United States on the tenth of May, is the seventh which has taken place during a period of twenty-five years. The first one being inaugurated in London, it was followed by the one in New York in 1853, which, although a failure in more than one respect, nevertheless exerted a powerful influence upon the development of arts and industries in this country, and served likewise to make the United States better known in foreign countries. Paris followed in 1855, London again in 1862, Paris in 1867 and Vienna in 1873. Several international exhibitions of special industries having in the meantime been held in various other European cities, a grand fair of the entire industries of all civilized nations was undertaken in commemoration of the centennial anniversary of the independence of the United States, and Philadelphia, from which place the declaration of independence emanated, was selected as the most fitting place to celebrate the one hundredth anniversary of that historical event.

The ground chosen for the grand gathering is in West Fairmount Park. The park takes its name from that portion of the public grounds where the principal water-works and the oldest of the present reservoirs have been built, which are still known as the Fairmount water-works and basins. From these works the present Park extends in a northerly and westerly direction, on both banks of the Schuylkill river, following afterwards the circuitous bed of Wissahickon creek, comprising, altogether, an area of 2,991 acres, and being divided by the Schuylkill into an east-

ern and western section. In the latter portion, from Girard avenue north, the hills rise suddenly to 116 feet above the Schuylkill, forming the extended Lansdowne Terrace upon which the Exhibition buildings have been erected.

These buildings are, altogether, over 190 in number, a few of which are still unfinished at this date. The largest number of these have been erected for special purposes, special exhibits, and for the accommodation and special interest of the various nations and States represented. Those buildings which are intended to accommodate the arts and industries of all nations are few in numbers, but necessarily very extensive.

The *Main Exhibition Building* forms a parallelogram 1,880 feet in length and 464 in width, and covering upon the ground floor an area of 20'02 acres, or 872,320 square feet. Nearly the whole structure forms one story, with a central height of 70 feet, the sides being 24 feet high. In the projections and towers are upper floors, with an area of nearly 64,000 square feet, or almost $1\frac{1}{2}$ acre.

Machinery Hall is located west of the former, and has a length of 1,402 feet, and a width of 360 feet, with an annex of 208 by 210 feet. It covers a ground space of 558,440 square feet, or 12'82 acres.

Memorial Hall accommodates sculptures, paintings and other products of the fine arts, and has been erected with a view to permanence, no wood having been used in its construction, and every portion of the building being fire-proof. It occupies the most commanding portion of the plateau, and is 365 feet in length by 210 feet in width, and 59 feet in height, over a basement 12 feet high, and surmounted by a dome rising to 150 feet from the ground. It covers an area of 1'5 acre.

The *Horticultural Building*, which covers the same area as Memorial Hall, and, like it, will not be taken down again, is situated north of it, has a length of 383 feet, a width of 193 feet, and an extreme height of 72 feet. It consists of a central conservatory, 230 by 80 feet, and 55 feet high, and has on each of its long sides two forcing-houses, 100 by 30 feet, covered with curved roofs of iron and glass. The heating arrangements, etc., are in the fire-proof basement.

The *Agricultural Building* is still farther north, and consists of a long nave, crossed by three transepts, the central one being 100, each of the two lateral ones 80 feet wide. The nave has a length of 820 and a width of 120 feet; its extreme height, like that of the central transept, is 75 feet, the end transepts being 5 feet less. It covers an area of 10'15 acres.

The buildings mentioned above comprise all the general Exhibition buildings. We have deemed it necessary to give a brief description of the *size* of these structures, so that our readers may form some idea of the immense amount of products on exhibition. Those which are of greatest interest to the pharmacist and druggist will mostly be found in the Main Building, a few in the Agricultural Building, some plants yielding drugs in the Horticultural Building, and those pharmaceutical apparatus which, for successful manipulation, *require steam-power*, in Machinery Hall.

Articles of more or less pharmaceutical interest will, however, also be found in the extensive building erected by the United States Government and in the Women's Pavilion.

The arrangement in the Exhibition halls is national, that is, a certain space has

been allotted to each nation, and within this space the exhibits are arranged so as to show the most important industries to best advantage. To find and examine all that is important or of special interest to pharmacy requires, therefore, a journey of many miles within the Exhibition grounds.

All the goods on exhibition have been placed in twenty-eight classes, the most important of which for us is Class III: "Chemistry and Pharmacy, with the apparatus," for which the following international Jury of Awards has been appointed:

American—Professor C. A. Joy, New York; Professor F. A. Genth, University of Pennsylvania, Philadelphia, Pa.; Professor J. Lawrence Smith, Louisville, Ky.; Professor C. F. Chandler, New York; Professor J. W. Mallet, University of Virginia, Charlottesville, Va. Foreign—Dr. Odling, F.R.S., Great Britain; Dr. R. von Wagner, Germany; M. Kuhlmann (fils), France; Mr. Dewilde, Belgium.

Articles of more or less interest to the drug trade will doubtless be found in some of the other classes.

VARIETIES.

SASSAFRAS AS AN ANTIDOTE TO VEGETABLE POISON.—The Cincinnati "Lancet and Observer" for April, has a paper by Dr. A. W. T. Lyle, of Castleton, Ind., in which attention is called to the statement by Dr. Thompson, of Nashville, concerning the antagonistic properties of sassafras to henbane and tobacco. Dr. Lyle mentions the case of a child four years old who had eaten stramonium flowers, and showed symptoms of poisoning. After the administration of emetics, ten drops of oil of sassafras were given every half hour until six doses had been taken, when consciousness returned, and, after taking a dose of castor oil, the child was playing the next day, and free from all pains or disturbances following poisoning.

HAIR TONIC.—The "Med. and Surg. Rep." for March 18th, gives the following from Erasmus Wilson's book on skin diseases, under the title of *Lotio capillaria stimulant*: Oil of almonds and strong ammonia water, each 1 oz., spirit of rosemary 4 oz., balm water, 2 oz.

RESOLVENT OINTMENT.—According to the "Med. and Surg. Rep.," the following ointment is employed with great success by Dr. Noel Guéneau de Mussy: Camphor one, ammonium chloride four, and lard thirty grams.

CURE FOR CORN. Bind raw cotton on your corn at night before going to bed, and then saturate the cotton with oil of turpentine. It will remove the most obstinate corn, either hard or soft, in four or five applications. The skin will be apt to peel off the toe, but this is rather an advantage, as it helps to remove the corn. —Correspondent of *Scient. Amer.*

SOLUTION OF SALICYLIC ACID. Prof. Emlen Painter proposes the following formula, whereby two grains of salicylic acid can be given in a teaspoonful of solution. Dissolve salicylic acid gr. xxxii in liquor. ammon. acet. fʒii. The solution may be made without heat, is not unpleasant to take, and possesses quite perceptibly the sweetish taste of the acid. Besides, solution of ammonium acetate would be likewise indicated in most cases, where salicylic acid would be prescribed for internal uses. Its cumulative action (see "Amer. Jour. Phar." 1876, p. 68), should not be lost sight of.—*Pacif. Med. and Surg. Jour.* 1876, April.

THE following notes are taken from the "Leaflets for the Scrap-book," issued by Mr. M. S. Bidwell, of Elmira, N. Y., which were noticed in our December number:

Hints to Prescribers.—Much perplexity might be saved to dispensers, and the danger of error materially lessened, by the observance of the following simple suggestions:

1. If the remedies prescribed are officinal, use the officinal terms; if not officinal, describe them unmistakably. The writer has heard of three different liquids called chloric ether, and has known Tully's Powder to be made of three very different degrees of strength.
2. Do not abbreviate so closely as to cause ambiguity; hyd. chl. may mean calomel, corrosive sublimate, or chloral hydrate.
3. Write the directions for use as they are to be put on the label.
4. Give the patient's name, and mention if a child or infant.
5. After writing the prescription, look it over and see if there is anything, especially in the numerals, that a careless or ignorant druggist might misunderstand.

Solubilities.—The following list gives approximately the number of grains of the salts mentioned, that can be readily dissolved in one ounce of water at the ordinary temperature. If this limit is much exceeded, a clear solution cannot be expected.

Potassium iodide	500
Ammonium bromide	300
Potassium bromide	240
do bicarbonate	120
do nitrate	100
Sodium borate	40
Potassium chlorate	30
Mercury bichloride	25

It should be remembered that the bulk of the solution exceeds that of the solvent; thus an ounce of water and an ounce of potassium iodide make about an ounce and a half of solution.

Curious Incompatibility.—Chlorate of potassium and iodide of potassium are both entirely harmless in suitable doses. Furthermore, these two salts do not react upon each other in solution, even at a boiling heat. Yet it has been proved that when they are administered together, they do combine in the stomach, producing iodate of potassium, which is poisonous. M. Melsens found that dogs could take the chlorate or iodide in doses of five to seven grams with impunity, but that a mixture of

the two killed them in a few days, with the symptoms of poisoning by iodate of potassium. This combination must therefore be avoided. Indeed, as a general rule, the chlorate is so unstable, and so ready to give up its oxygen, that it cannot safely be combined with any substance capable of oxidation.

Notes on Disinfectants.—Salicylic acid loses its power entirely in an alkaline solution, the salicylates not destroying fermentation germs.

It has been taken internally to the amount of 1.5 grams (23 grs.) daily, without injury. About 3 grs. a day have been given as a prophylactic against diphtheria, with apparent good result.

Carbolate of Lime.—Chemical examination has shown that five out of six samples in the market were nearly worthless, containing hardly any phenol, but owing their smells to various tar oils possessing little or no disinfectant power. An excellent carbolate may easily be made by mixing one part of crude carbolic acid with eight parts of slaked lime.

Chloral hydrate is a powerful antiseptic, and has been used with special success in preserving anatomical specimens.

BEECH WAX. By F. A. Flückiger.—On the bark of beech trees there occurs a greyish film, formed by insects, fatty to the touch, and consisting, as shown by the microscope, of fine threads, which are easily broken up. The substance composing it is scarcely acted on by water. It gives up to boiling carbon bisulphide about one-third of its weight of a wax crystallizing in white laminæ, melting at 81° — 82° , and having the composition of cerotic acid, $C_{27}H_{54}O_2$. The wax, however, when dissolved in alcohol, does not redden litmus, as does cerotic acid, nor is it attacked by prolonged boiling with aqueous or alcoholic potash.—*Jour. Chem. Soc. [Lond.]*, from *Arch. Pharm.* [3], vii, 8.

MINUTES OF THE PHARMACEUTICAL MEETING.

The eighth regular meeting of the session was held May 23d, 1876, Edward Gaillard in the chair. The minutes of the previous meeting were read and approved.

Mr. Edward Lindewald, of Stockholm, Sweden, was introduced and invited to participate in the meeting. Prof. Maisch donated to the cabinet, from Daniel B. Smith, some additional plants for the herbarium, and the press with which they had been pressed. They were accepted with thanks.

The Registrar read a paper by Walter E. Bibby on the Pharmaceutical value of sugar of milk (see page 267). Prof. Maisch had remarked upon a former occasion that the observations made by the writer were of great importance to practical pharmacy and would repeat the statement. The sample of powdered myrrh exhibited, although apparently somewhat agglomerated, when rubbed between the fingers would be found to be in a fine state of division, and to judge from the odor, contains the entire amount of volatile oil. The mercury with chalk, under an ordinary lens, appeared as a powder perfectly uniform in color, and was, to all appearances, free from oxides. The paper suggested numerous applications. Mr. Bibby stated, in answer so a suggestion, that he had made numerous experiments with asa-

foetida, with variable results, but found that by the addition of an equal amount of sugar of milk a permanent powder could be produced.

The Professor remarked he could well see the cause of the variable results, which must be due to the variable composition of commercial asafetida, which, according to Prof. Dymock, of Bombay (see "Amer. Jour. Phar." 1875, 320), is generally more or less adulterated.

Prof. Remington thought it advisable to find out the smallest possible amount of sugar of milk required in the case of each drug.

Mr. Bibby thought in preparing emulsions with these powders a mortar should be used, mere agitation in a vial not always yielding good results.

William McIntyre read a paper on a wafer machine and press, (see page 267) illustrating its use in actual practice. All the apparatus necessary for making one size of wafer disks and capsules had cost \$3.

Prof. Maisch showed a handkerchief with initials marked thereon eleven months ago, by placing upon it the lower surface of a leaf of *Magnolia glauca* and tracing the letters upon the upper surface with a pointed instrument, using some pressure; he stated that his attention had been called to this property by C. E. Hornberger, a member of the last graduating class. The handkerchief exhibited had been frequently washed, without affecting the marking.

A. P. Brown exhibited an inhaler for gaseous chloride of ammonium, which has been devised by H. P. Reynolds, of Plainfield, N. J., and may be prepared from an ordinary wide-mouth bottle, closed with a tightly fitting perforated cork, so as to admit of two tubes. One of these is a glass syringe tube, passing nearly to the bottom and filled with small pieces of sponge; while the longer, which is bent to be applied to the mouth, may have its origin just below the bottom of the cork. When it is wanted for use, the cork is removed, and after placing three or four drops of chemically pure muriatic acid in the bottle, and the same quantity of strong aqua ammoniæ in the syringe tube containing the sponge, the mouth-piece of the inhaling tube is taken between the lips for the purpose of inhalation. In drawing air through the apparatus, the ammonia combines with the muriatic acid, and the air becomes charged with vapors of ammonium chloride.

Prof. Remington described a convenient way of inhaling substances which are usually added to hot water—a rubber tube is slipped over the small end of a funnel which is placed as a cover over a tin vessel containing the water and drug.

Prof. Maisch exhibited the seeds of *Paullinia sorbilis*, which are used in South America in the preparation of guarana; *Strassburg turpentine*, Terebinthina argentinensis from *Abies pectinata*, which is similar in appearance to Canada balsam, and used in Europe for similar purposes; *Dita bark* from *Echites scholaris*, which has attracted some attention as a febrifuge; the rind of the fruit of *Garcinia mangostana*, recommended as a reliable remedy in dysentery; *Goa powder*, which contains much chrysophanic acid, and is stated to be very useful as an external application in ringworm and other skin diseases; the fruit of *Myrcia acris*, resembling allspice, but more oblong in shape, which is used with the leaves of the same plant in the distillation of bay-rum; a white crystalline *saccharine principle*, which has been isolated by Prof. E. S. Wayne, from American bitter-sweet, the bark of *Celastru scandens*, and the highly-aromatic volatile oil of spice-berry, the fruit of *Benzoin*.

A. P. Brown exhibited aromatic waters of cinnamon, peppermint and spearmint, and Edward C. Jones samples of cinnamon water, made by various processes, and desired information as to how many pharmacists prepared the water from Ceylon cinnamon, and to what extent cassia was used. A. P. Brown having recently given some attention to this subject, thought but few used Ceylon cinnamon.

This being the last regular meeting of the session, and it being the opinion of the members that it would be profitable to still continue them, a motion was adopted to adjourn to meet upon the 20th day of June.

WILLIAM MCINTYRE, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

PHILADELPHIA COLLEGE OF PHARMACY.—Since the close of the examination, in March last, the building has been thoroughly renovated, and a number of permanent and temporary improvements have been added, the latter being more particularly intended for the convenience of the visiting pharmacists from this and foreign countries, who are expected to visit Philadelphia during the next four or five months. Adjoining the laboratory, a one-story brick building has been erected some months ago, with the view of accommodating Prof. Maisch, and furnishing additional conveniences for his labors in connection with the "Journal" and as Secretary of the American Pharmaceutical Association; it is likewise used as an analytical balance room. Amongst the alterations made in the laboratory may be mentioned the removal of the fume-closet to an adjoining building, recently put up. The old cabinet cases have been taken from the meeting room to furnish better accommodations for the private collections of the professors. The cabinet of *Materia Medica* and Chemistry has been entirely refitted by the curator, Professor Remington, and now presents not only a very attractive appearance, but, what is of greater importance, it contains many interesting and valuable specimens carefully preserved. The general herbarium of the College, the nucleus of which consists of the valuable collection presented, many years ago, by the late Elias Durand, has been classified and partly catalogued; while the herbarium recently presented by Daniel B. Smith ("*Amer. Pharm. Jour.*," 1875, p. 514), has been arranged in the cases provided for it. The library has been put in thorough order by the librarian, T. S. Wiegand, and now offers ready convenience for consulting it. The alterations in the lecture rooms consist mainly of improvements in the means of ventilation, and additional facilities for illustrating the lectures.

Amongst the transient preparations is to be mentioned the erection of a temporary building, in which the closets and wash-basins, desirable for the convenience of visitors, have been placed.

The formal opening of the renovated building took place on the evening of May 23, when, in response to the invitation of the hall committee, a large number of members, visiting pharmacists and other guests, with their ladies, assembled in the lower hall, which appeared like a tropical garden, from the numerous plants

judiciously arranged therein. Most of the plants, which were kindly loaned for the occasion from the hot-house of Prof. Geo. B. Wood, represented some official articles, such as sago, sugar, coffee, tea, cinnamon, &c. The entrance hall had been handsomely decorated with the flags of the nations represented in the international exposition, a glass tablet, with the following greeting, being suspended from an arch in the centre of the hall:

“COLLEGIUM PHARMACEUTICUM PHILADELPHIENSE ARTI MEDICAMENTARIÆ
 OPERAM DANTES UBICUMQUE GENTIUM SALUTAT.”

In the lower lecture room the company was treated to an exhibition with the College stereopticon, the oxy-hydrogen lamp being, for the evening, in charge of Mr. D. S. Homan, of the Franklin Institute; Dr. J. G. Hunt exhibiting a number of Microscopical preparations; Mr. Charles Bullock following with an exhibition of American and foreign sceneries. The company, afterwards, repaired to the lower hall, where an acceptable collation of ice cream and cakes had been provided, and small bouquets were handed to those present. After further social intercourse, the company dispersed.

Great credit is due to the hall committee (Messrs. C. Bullock, T. S. Wiegand and Wm. Bakes) for the manner in which the improvements were made, and the very satisfactory arrangements for this opening reception.

THE ALUMNI ASSOCIATION OF THE MASSACHUSETTS COLLEGE OF PHARMACY has elected the following officers for the ensuing year: Edward S. Kelly, President; Chas. M. Howe and James S. Whall, Vice-Presidents; S. A. D. Sheppard, Secretary; Jas. C. Lowd, Treasurer, and Wm. W. Bartlett, auditor.

At the annual supper, at the Revere House, on April 21, more than eighty were present; speeches were made, and harmony and good feeling prevailed until the hour of separation arrived.

THE NEW JERSEY PHARMACEUTICAL ASSOCIATION held its sixth annual meeting in the assembly room of Masonic Hall, New Brunswick, on Wednesday, May 17th, 1876. The meeting was called to order by the President, J. L. DeLaCour, and, after delivering his annual address, an election for officers for the ensuing year was held with the following result: President, H. P. Reynolds, of Plainfield; Vice-Presidents, A. S. White, Mount Holly, and Wm. M. Townley, Newark; Treasurer, Wm. Rust, New Brunswick; Recording Secretary, A. P. Brown, Camden; Corresponding Secretary, C. B. Smith, Newark; Standing Committee, G. A. Mangold, Trenton; J. H. Van Deursen, New Brunswick; Charles Holzhauser, Newark; R. J. Shaw, Plainfield.

On account of the Centennial Exposition, in Philadelphia, the local committee were unable to prepare an exhibition of drugs, but invitations were extended to visit the hard and soft rubber factories, the brussels carpet factory and the hosiery factory, and, after the morning session, the members, with their ladies, spent about two hours in examining the above-named places.

The next annual meeting will be held in Newark, and the Association decided not to hold any summer meeting, and not to issue any proceedings this year.

CINCINNATI COLLEGE OF PHARMACY.—The third pharmaceutical meeting was held May 10th, F. L. Eaton in the chair. After the approval of the minutes, the following donations were made to the cabinet. From H. F. Reum, select specimens of Ceylon cinnamon, cassia lignea and cassia barks, from Saigon, Batavia, China and Java. Mr. Reum, in his remarks, criticized, very severely, the substitution of the cassia bark for the real Ceylon cinnamon, when prescribed.

Prof. Wayne presented the two alkaloids of veratrum viride, veratroidia¹ and jervia; also arbutin, prepared from uva ursi; the oils of stramonium and lobelia seeds, the root of the osage orange and the crystallizable resin of the fluid extract of eucalyptus.

The Professor also submitted a formula for New Orleans mead, which he had used for years, and the product of which had always met with a ready sale. It is as follows: eight ounces each of sarsaparilla, liquorice root, ginger and cassia barks, two ounces of cloves and three ounces of coriander, suitably cut and bruised, are boiled for fifteen minutes, in eight gals. water, allowed to cool and settle, and then strained through flannel. To this is added, in the fountain, 1½ gal. syrup, ¼ gal. honey, four ounces each of tincture of ginger and solution of citric acid, and, afterwards, sufficient water to make ten gallons, when it is charged with carbonic acid gas.

At the next meeting, Prof. Judge will read a paper on dilute phosphoric acid, and Prof. Fennel one on a new series of alums.

The board of trustees having, at their last meeting, unanimously elected Prof. Wayne to the degree of Doctor in Pharmacy, the President, at this meeting, conferred the degree and presented the diploma. Prof. Wayne, in receiving this unsolicited honor, responded in appropriate terms.

THE PHARMACEUTICAL ASSOCIATION OF THE PROVINCE OF QUEBEC.—At the Spring examination, fourteen candidates presented themselves for the degree of *Certified Clerk*, and two for the degree of *Licentiate in Pharmacy*; six were rejected. in the minor and one in the major examination.

This Association is the sole examining and licensing body in the province, being incorporated by act of parliament. In order to furnish instruction by lectures, the association has organized a College of Pharmacy (see "Amer. Jour. Phar." 1875, p. 427), which institution has not the power to license.

EDITORIAL DEPARTMENT.

THE SANITARY CONDITION OF PHILADELPHIA is of general interest during the present year, when many visitors will be attracted to this city by the International Exposition, and reliable information on this subject will for this reason be welcome to all contemplating to view the grand collection of the products of nature and of

¹ Veratroidia, according to Mr. Bullock's recent investigations (see April No., p. 153), is merely jervia, contaminated with resin.—EDITOR AMER. JOUR. PHARM.

art and science from all parts of the globe. The following communication will furnish this information :

United States Centennial Commission—International Exhibition, 1876, Philadelphia—Bureau of Medical Service.—Owing to the very large number of persons who contemplate a visit to Philadelphia during the coming summer, it seems important that the utmost publicity should be given to all facts bearing on the sanitary condition of the city.

The following statistics, which have been obtained from the most authentic sources accessible, represent the mortality in some of the chief cities of the world during the past four or five years :

	Number of Years.	Average Population.	Average Total Mortality.	Average Death Rate per Thousand.
Vienna.....	5	648,560	20,424	31'42
New York.....	5	994,458	29,601	29'93
Berlin.....	4	950,000	28,420	29'91
London.....	5	3,284,488	76,741	23'33
Paris.....	4	1,851,792	42,724	23'06
Philadelphia.....	5	744,831	16,573	22'27

While thus showing an average rate of mortality more favorable than that found in any other city containing over 500,000 inhabitants, Philadelphia has recently (1874) attained a degree of healthfulness almost unparalleled, viz., with a population at that time of 775,000, the number of deaths was but 14,966, giving a death rate of only 19'3 per thousand. These very favorable results are largely due to the abundant and cheap water-supply, and to the opportunities given, even to the poorest citizens, for the enjoyment of pure country air in the great Fairmount Park, which contains 2,991 acres. The extent to which this is valued by the citizens may be inferred from the fact that during the year 1875, the Park was visited by over eleven million persons.

The most powerful influence of all, however, is the absence of that overcrowding of the population, which is the most fruitful source of sickness and death in many quarters of nearly all other large cities. This will be more clearly comprehended when it is remembered that the 817,488 inhabitants of Philadelphia are spread over an area of 129¼ square miles, which are traversed by more than one thousand miles of streets and roads ; and that the city contains, in addition to other kinds of buildings, 143,000 dwellings-occupied by families,—a number exceeding by over 40,000 that of any other city in America.

The climate of Philadelphia is also, on the whole, a favorable one, although presenting many of the peculiarities common to inland localities. The mean annual temperature of the last ten years is 53 73° Fahrenheit ; the average annual rain-fall is about forty-five inches.

The following table exhibits the mean temperature of each month for the past ten years, showing that the range is far less extreme than is found in many other less favorably situated localities :

Mean Temperature (Fahrenheit) of Each Month during the Past Ten Years.

January.....32'72° F.	May.....63'24° F.	September .....67'72° F.
February.....33'12 "	June .....73'54 "	October .....56 03 "
March.....39'16 "	July.....78'74 "	November.....43'34 "
April.....53'36 "	August .....75'98 "	December.....33'92 "

It is thus seen that only during the months of June, July and August does the mean temperature rise to a high point. During this period there are very rarely any prevailing epidemic diseases ; and the chief mortality occurs among children, especially among the poorer classes.

The health of Philadelphia at present is unusually good. Timely efforts have been made to secure an abundant water-supply to meet the great increase in the demand which must be expected this summer as compared with previous years. Constant watchfulness will be exercised by the authorities to maintain cleanliness, and to avoid or remove every possible cause of disease.

Within the Exhibition grounds a rigid sanitary inspection will be maintained, under the control of the Bureau of Medical Service; and thus a guarantee will be afforded that no cause of infection or disease will be allowed to occur through neglect of this important duty.

The object of this circular has been to call attention to the unusual sanitary advantages of Philadelphia, and to the preparations which have been made to insure the highest possible degree of healthfulness during the approaching Exhibition season. It is proposed to issue at certain intervals other circulars, announcing in an official and accurate manner the sanitary condition of the city, so that entire security may be felt by all who desire to visit the Centennial International Exhibition.

15th April, 1876.

WILLIAM PEPPER, M.D., *Medical Director.*

SOLUTION OF TARTRATE OF SODIUM has, to some extent, replaced the citrate of magnesium as a laxative medicine. The various formulas which have been published direct the combination of tartaric acid with crystallized carbonate of sodium, a salt which, on exposure to the air, readily parts with a considerable proportion of its water of crystallization, and is therefore with difficulty kept of a uniform composition, unless it be dehydrated. In view of this, it is rather surprising that the employment of the more stable and uniform *bicarbonate* of sodium has not been proposed heretofore. Mr. H. M. Wilder informs us that he has made the solution for some time, by combining sod. bicarb. $\mathfrak{Z}_{\text{vss}}$ with acid. tartar. $\mathfrak{Z}_{\text{ivss}}$, using four pints of water for dissolving them. Into each bottle is put $1\frac{1}{2}$ fluidounces of simple syrup, 2 or 3 drops of spirit of lemon, the bottle is filled with the solution of sodium tartrate, after which 45 grs. of crystallized citric acid are added, and the bottle corked.

The taste of this solution differs from that of magnesium citrate, and appears to be more acceptable to the majority of patients, while in laxative effects the two are probably about alike.

AMERICAN CHEMICAL SOCIETY.—At the “Centennial of Chemistry,” celebrated by a number of American chemists at Northumberland, Pa., August 1st, 1874, it was proposed to form a national chemical society. The proposition was not then favorably entertained; the establishment of a chemical section in connection with the American Association for the Advancement of Science, appeared to the majority of those present to meet all necessities. The advantages of a national chemical society, however, have been so apparent in England, France and Germany that the proposition of several New York chemists to form a similar society in this country met with such a hearty response from all sections of the United States, that during the past month the American Chemical Society was established with 53 resident (within a radius of thirty miles from New York) and 80 non-resident members. The officers for the current year are: Prof. J. W. Draper, New York, President; J. L. Smith, Kentucky, F. A. Genth, Pennsylvania, E. W. Hilgard, California, J. W. Mallet, Virginia, C. F. Chandler, New York, and Henry Morton, New Jersey, Vice Presidents; George F. Barker, Pennsylvania, Corresponding Secretary; Isidor Walz, New York, Recording Secretary; H. M. Habirshaw, New York, Treasurer, and P. Casamajor, New York, Librarian.

The objects of the Society are the encouragement and advancement of chemistry in all its branches, in furtherance of which monthly meetings will be held in the city of New York on the first Thursday of every month, and it is contemplated to hold one meeting in each year outside of New York city, at such a time and in such

a place as to make attendance on the part of non-resident members more convenient and representative. It is likely that the first one of these meetings will be held in Philadelphia during the approaching summer.

Chemists desirous of becoming members of the American Chemical Society, should address the Committee on Nominations, Post-office box, 1,396, New York City.

THE LIEBIG MONUMENT.—We learn from German papers that the collections for the proposed Liebig Monument amount thus far to 140,000 marks (nearly \$35,000). It is intended to erect the monument upon the Dult Place in Munich, but neither has the artist been selected, nor has a design been formally adopted.

MURDEROUS ATTACK IN A LABORATORY.—Prof. Otto, of the Polytechnic School at Brunswick, Germany, was attacked by an employee at the pharmaceutical and chemical laboratory and seriously wounded, toward evening of April 22d. It appears that the professor had censured the man for carelessly breaking an apparatus, and was afterwards assaulted by him with some blunt instrument, probably a pestle, receiving eight wounds about the head. Fortunately the wounds, although very serious, are not absolutely dangerous, and there is hope of the ultimate recovery of Prof. Otto. The perpetrator of the dastardly act was soon after arrested, and lodged in prison, where he put at end to his life by hanging.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

C. H. Hobbs' *Botanical Text-book of common, local, English, Botanical and Pharmacopæial Names*, arranged in alphabetical order, of most of the crude Vegetable Drugs, &c., in common use; their Properties, Productions and Uses in an abbreviated form. Especially designed as a reference-book for Druggists and Apothecaries. In Three Parts. Compiled and published by Chas. E. Hobbs, Boston: 1876. Large 8vo, pp. 271. Price \$3.50.

The very lengthy title of this book is almost sufficient to give a synopsis of its contents. The first part, which is headed ENGLISH, contains three columns, respectively marked *Common*, *English* and *Botanical*, the latter containing the botanical names of the plants, and the second column the English names more generally employed, while the first column aims at giving *all* the English names of more local use, and including likewise the names found in the second column. We fully recognize the difficulty of such an arrangement, and it could hardly be otherwise but that discrepancies should be found here; thus for instance for the common name of *acorn* the English *Fruit of the oak* is given, while for *Anise*, *common* the English *Anise SEED* is used. We rather expected the second column to contain the definition of the word of the first column, an idea which is really carried out in some portions of the first part, like under the head of *oils*, where the second column usually defines the nature of the oil, whether fixed, expressed, distilled, &c., and the part of the plant from which it is obtained.

The second part, entitled BOTANICAL, likewise contains three columns, in the first of which the botanical names and some of their synonyms are given in alphabetical order; in the second the common English names, and in the third the part of the plant employed and its medicinal properties. The latter portion is given abbreviated and an explanatory table of the abbreviations used precedes the second part.

The third part, headed PHARMACOPŒIAL, has in the first column the names as official in the United States, British or German pharmacopœias, or as still occasionally employed. In the second and third columns are found the corresponding common and botanical name. The first column may serve to some extent for comparing the system of nomenclature adopted by the three pharmacopœias, as for instance *Gentiana*, *Gentianæ radix* and *Radix Gentianæ* are the names of the U. S., Br. and Ger. pharmacopœias indicating the same drug, viz., the root of *Gentiana lutea*.

An appendix contains an alphabetical list of the German names of the crude vegetable substances official in the German pharmacopœia, a second column giving the Latin official and a third column the botanical name.

The mechanical part of the work is satisfactory. The types are clear, and although we have observed occasional misspelling, we have not observed any incorrectness.

We have entered thus extensively into the arrangement and character of the work before us, because we believe it to be a very valuable one for druggists as well as pharmacists, the first part being perhaps the one of greatest *practical* value in determining the meaning of the numerous common names of mere local use, of which names not less than 8,000 are enumerated in the first column; and yet full and complete as this list is, we have incidentally observed that one reference has been overlooked, and mention this here merely for the purpose of referring to an erroneous statement published twenty-one years ago which has remained uncorrected ever since. Having had occasion recently to refer to a communication by H. G. and L. B. Hotchkiss in the "*Amer. Jour. Phar.*," 1855, p. 222, the statement attracted our attention that the weed most commonly found in peppermint plantations was "by some called broomweed, by others mare's tail (*Hippuris vulgaris*)." The plant mentioned, however, is rather rare in this country and is *never* found in mint plantations because it is an aquatic plant; mare's tail is merely one of the numerous synonyms by which *Erigeron Canadense* is known in some localities (see "*Amer. Jour. Phar.*," 1870, p. 121.)

Jahresbericht über die Fortschritte der Pharmacognosie, Pharmacie und Toxicologie, bisher herausgegeben von Dr. A. Wiggers und Dr. A. Husemann, fortgesetzt von Dr. G. Dragendorff, ord. Prof. der Pharmacie in Dorpat. Neue Folge; 9 Jahrgang, 1874. Göttingen: Vandenhoeck & Ruprecht's Verlag, 1875. 8vo, pp. 549.

Annual report on the Progress of Pharmacognosy, Pharmacy and Toxicology, for 1874.

We have seen this annual report only recently, through the kindness of Mr. Wilder, else it should have received an earlier notice. After the publication of the report for 1873, the venerable Prof. Wiggers declined its further preparation, owing to his advanced age, and Prof. Husemann found his time so much occupied as to

be unable to contribute the compilation of the toxicological researches. Prof. Dragendorff then agreed to furnish the report, and although the time for accomplishing this has been very limited, he has, aided by Messrs. E. Masing, E. Johansson, Nentwich and Prof. Morel, succeeded in producing a volume which is in every way a worthy successor of the long series of thirty volumes edited by Prof. Wiggers.

The arrangement of matter remains nearly unaltered, and the selections are as complete and the references to the various journals as full and accurate as to leave nothing to desire. We confess, however, to have been somewhat surprised in finding enumerated in the bibliographical list a work on new-school remedies, by the notorious Dr. Paine, which would not have received the same compliment on this side of the Atlantic.

Twelfth Annual Report of the Alumni Association of the Philadelphia College of Pharmacy. 1876. 8vo, pp. 46.

The pamphlet contains Prof. Remington's Valedictory Address, Mr. Eberle's Annual Address, the President's Report, an account of the Annual Reception in March last, Minutes of the Meetings of the Association and of the Executive Board, etc. We learn from the minutes that, in addition to the Alumni prizes mentioned on page 186 of our April number, a silver medal has been awarded by the Executive Board to Mr. Henry Schroeder, of Chicago, besides the certificate of proficiency received by him in March; also, a certificate of proficiency in chemistry to Mr. J. C. Martin, of Allegheny City.

OBITUARIES.

ANTOINE JEROME BALARD, member of the Paris Academy of Sciences and Professor of Chemistry at the College de France, died in Paris, last April, after a short illness, which, for several months, had been preceded by a gradually-increasing debility. Balard was born at Montpellier in 1802, received a thorough pharmaceutical education, and was afterwards attached, as *Préparateur de Chimie*, to the School of Pharmacy and Faculty of Sciences of his native city. While laboring in this capacity, he liberated from the ashes of seaweed a new element, to which he gave the name of *bromine*. The essay announcing this discovery was published in 1826, and contained extended researches by which the young discoverer proved its chemical analogy to the previously-discovered elements, chlorine and iodine. This discovery was made only a short period after the opposition against the elementary nature of chlorine had ceased; its effect upon the alkalies and alkaline earths, however, could not be harmonized with existing theories, until in 1834 Balard announced the discovery of *hypochlorous acid*, and explained the chlorinated compounds mentioned as mixtures of chlorides and hypochlorites. Amongst Balard's researches which were destined to have an important bearing upon industrial arts, should be mentioned yet his investigations upon the salts of sea-water, with a view of utilizing, besides the sodium, also the potassium salts.

The gradual development of the theories relating to organic chemistry was materially aided by Balard, among the most important of his discoveries in this direction being the preparation (1841) from binoxalate of ammonium, of *oxamic acid*, the representative of the limited class of amin acids, and (1844) the separation of *polymeric compounds of amylene*, while attempting to prepare the latter from amylic alcohol.

In 1842, he was called to Paris to fill the chair of Chemistry in the Faculty of Sciences, formerly occupied by Thénard, and since 1851 he labored in a like capacity at the Collège de France.

Balard's researches were characterized by great exactness and minuteness, leaving to others very little, if anything, to correct. Amongst the pharmacists whose scientific labors have, directly or indirectly, created great industrial pursuits, his name stands among the first ranks. He was an honor to his profession and to the science to which his inclinations were directed; kind of disposition and free from envy or jealousy, he was always ready with valuable advice to aid the investigations of others.

MICHAEL DONOVAN, M. R. I. A., died in Dublin, March 27th, at the advanced age of 85 years. His name is well known to American pharmacists as the originator, in 1839, of Donovan's Solution, the *Liquor Arsenici et Hydrargyri Iodidi*, of the "U. S. Pharmacopœia." In former years, Mr. Donovan paid much attention to electricity and electro-chemistry, but at a later period was almost exclusively devoted to pharmacy, contributing quite a number of papers to several journals, several of which were reproduced in the earlier volumes of this journal. Amongst the more recent ones may be mentioned the "Historical sketch of the dismemberment of pharmacy from physic" (1868), "On the process for preparing James' powder" (1869) and "On tincture of hyoscyamus" (1871).

DR. JEAN FRANÇOIS VLEMINCKX died at Brussels, March, 17th, in the 76th year of his age. The deceased was widely known for his researches in hygiene, and had labored for many years in the sanitary service of the Belgian army, in which service, at the time of his demise, he held the honorary position of Inspector-General. He was one of the founders and President of the Royal Academy of Medicine, since 1864 a member of the Chamber of Deputies, and held many other positions of trust and honor.

DR. J. S. UNZICKER died at Cincinnati, April 18th, of apoplexy, aged 63 years. He was a native of Germany, but had been practising medicine in Cincinnati for many years. He was a member of the Cincinnati Academy of Medicine, and always took a lively interest in the progress of pharmacy.

JOSEPH N. HENDERSHOTT, a native of Bloomsburg, Pa., and during last winter a student at the Philadelphia College of Pharmacy, was suddenly taken sick on the evening of the Commencement, March 14th, and died of typhoid fever on the 20th of the same month, aged 22 years. He was an active and promising student, and of a genial disposition.

THE AMERICAN JOURNAL OF PHARMACY.

JULY, 1876.

ON RAPID FILTRATION.

BY E. C. H. HILDEBRAND.

Though much has been said and written on this subject, still it does not seem to be exhausted yet, not long ago new suggestions having been made in that direction. Viewing this matter from a practical standpoint, it appears to me that we should not aim so much at the utmost gain of time in filtering and washing out precipitates, but rather at a more uniform good result of these operations. In accordance with this view, the following described apparatus will be found both convenient and effective enough to shorten the filtering process, and the drying of the filter and its contents quite considerably.

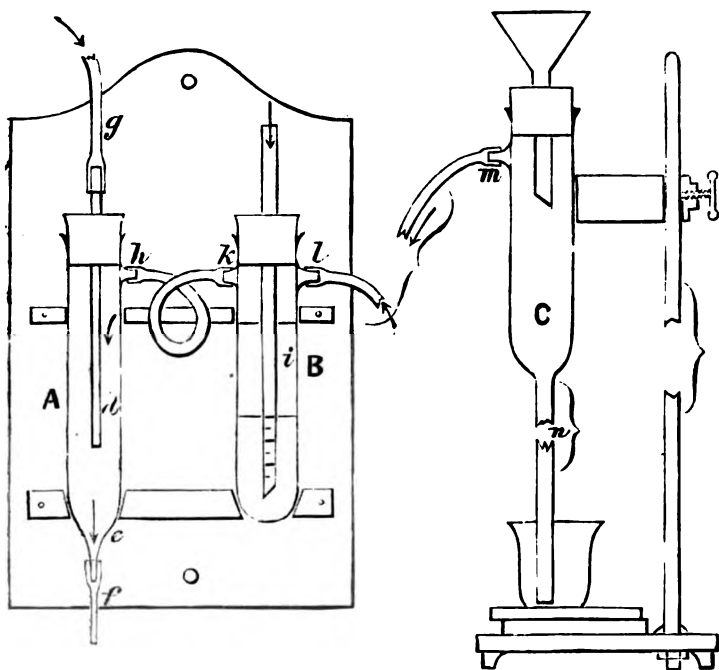
It is composed of *Weil's* filtering tube, and *Scheibler's* drop aspirator, to which I have added a vacuum regulator. The filtering tube (recommended by *Weil* about 16 or 18 years ago) allows to filter under a pressure of 1 to 2 feet of water column, without any other support of the filter except the funnel itself. It allows, further, to filter into any kind of receptacle, which will be found a great convenience. On the other hand, *Scheibler's* drop aspirator, used as a filtering pump, is by far the most perfect one in reference to the effect produced by a given quantity of water, while its absolute effect is likewise very satisfactory for filtering purposes. The vacuum regulator is intended to prevent the rarefaction of air surpassing a certain degree.

Before entering into a more detailed description of the whole arrangement, it may be well to make a few remarks about funnels and filters.

It has been laid down as a rule, that the sides of a funnel should have an angle of inclination of 60 degrees, in which case a filter, folded at right angles, will fit exactly into the funnel. I found that a filter adjusted into a funnel of a more acute angle offers remarkably greater security against breaking, provided, of course, the body of the

funnel approaches as nearly a perfect cone as possible. In this case the transition of the cone into the tube is marked by a distinct angle, formed by the meeting of two straight lines. The opening at the bottom of the funnel must not be too large, its diameter should not surpass $\frac{1}{4}$ inch.

A filter inserted into a funnel of 50 degrees, moistened and brought in perfect contact with the glass by pressing with the finger, will stand the pressure of a column of water $1\frac{1}{2}$ feet high with safety. Filters supported by funnels of 30 degrees did not rupture by the weight of a column of water 3 feet high. Funnels over 50 degrees require the introduction of another but smaller paper filter, inside of which, and over-reaching it, the main filter is inserted.



1. *The filtering tube* (see sketch C) consists of a wider upper part, carrying the funnel, and a lower narrower part, reaching almost to the bottom of the receptacle, and dipping into the filtered liquid. By rarefaction of the air in C, the filtered liquid is raised to a certain height, and therefrom results an increased pressure on the liquid in the funnel,

and an accelerated filtration. The total length of the tube is 20 inches, width of the upper part $1\frac{1}{2}$ inches, its length 6 inches. The narrow side tube *m*, is 1 inch below the rim of *C*. Internal diameter of lower part $\frac{5}{8}$ inch, its length 14 inches. The lower part must be wide enough to allow air bubbles to rise or overcome the capillary attraction exerted by the sides of the tube upon the liquid. The tube is closed by a perforated India rubber cork, receiving the neck of the funnel, the opening of which reaches 1 or 2 inches below the little side tube *m*. The whole is held in position by a retort-stand, burette-holder or the like.

2. *The aspirator A*. Upper part 1 inch in diameter and 6 inches long, the bottom forming a cone, connecting it with the lower part *e*, which has $\frac{1}{2}$ inch internal diameter, and is 1 or more inches long. To this we attach a rubber tube *f*, 5 or more feet long, and of the same internal diameter of $\frac{1}{2}$ inch. The narrow side-tube *b* is 1 inch below the top of *A*. A perforated rubber cork, provided with a glass tube *d*, is inserted, as seen in the sketch. This tube has $\frac{1}{8}$ inch internal diameter, extends downward about 3 inches, upward 1 or 2 inches. To this upper end a rubber tube *g* is attached, destined to supply the water for the aspirator, from an elevated vessel. If the flow of the water is so regulated (by means of a faucet or pinchcock) that it leaves tube *d* drop by drop, these drops falling into the narrow tube *e*, and its continuation *f*, perpendicularly beneath it, and, filling out its entire width, act the part of the piston in a pump, as, by their motion downwards, they carry with them the air enclosed in the tube between the single drops. In this way the air in *A*, as well as in any vessel connected with it by the communication tube *b*, is rarefied. The aspirator—equal lengths of time taken into consideration—draws less air if the drops follow each other slower, but then a higher effect is produced by a certain quantity of water, whilst if the drops fall quicker, the apparatus draws more air in that time, but the effect of the same quantity of water is diminished. Thus, 1 volume of water draws from 10 to 25 times its volume of air.

3. *The vacuum regulator B*. After several experiments, I found a mercury valve of the construction shown in sketch *B*, working as well as could be wished. *B* has $1\frac{1}{2}$ inch or more internal diameter and is about 6 inches long. The narrow side tubes *k* and *l* are opposite each other, and 1 inch below the rim. A good soft cork, free from holes,

is selected and perforated for the reception of tube *i*. The latter has about $\frac{1}{8}$ inch internal diameter by 9 inches in length. Its lower end is cut off obliquely and provided with marks showing $\frac{1}{8}$ inches, and beginning at the obtuse angle of the oblique cut. Tube *B* is filled up with mercury to a height of about 2 inches, then 2 inches of water are given on the top of this. The working of this valve is easily understood. By moving tube *i*, downwards or upwards, its lower end is, to a larger or smaller extent, immersed in the quicksilver, and if suction is applied to one of the side tubes, the other being connected with a closed vessel, the rarefaction of air in *B*, and in the vessel connected with it, will reach a certain maximum degree, beyond which it cannot go; air entering by way of tube *i*, and penetrating the mercury, it maintains that status in the apparatus to which the valve has been adjusted. If the end of tube *i* is cut off obliquely, as directed, the passage of the air through the quicksilver goes on more quiet, not so eruption-like, and the supernatant water prevents entirely the spattering of the metal. Several physical causes unite to give the graduation on tube *i* only an empirical value. Under the circumstances named, $\frac{1}{8}$ inch immersion of tube *i* will create in *C* a water-column of about 15 inches height.

4. *The connection* of the single parts is effected by rubber tubing, which need not be of the heaviest kind, as it is not exposed to any high external pressure. Aspirator and mercury valve are best mounted on a board (as seen in the sketch) and hung in a proper place on the wall, within reach of the hand.

If this apparatus is to be constructed out of material on hand in every laboratory, we may take a chloride of calcium tube for the aspirator (Scheibler), and a large test-tube, or any wide-mouthed bottle, for the regulator, in which case the communication of the single parts is brought about by perforations in the corks.

In case it should be preferred to make use of *Bunsen's* platinum funnels, we can proceed a little different from *Bunsen's* method, as such an exact fit as needed in high pressure is not wanted in our case. Divide a round piece of moderately thin platinum foil, about $1\frac{1}{2}$ inch in diameter, into two equal halves, and shape them into cones, the centre of the circle forming the apex of the cone. In funnels of less than 60 degrees the sides overlap, in funnels of 60 degrees they meet exactly, but can even then be soldered together in one point about the

middle of the cone by a grain of gold and a little borax. I cut off the point of the cone to create a small opening there, as I also perforate the sides of the cone near its apex with a pin.

Before leaving this subject, I will mention, with a few words, a most simple device which I have frequently used to promote filtration, and which consists of a piece of rubber or glass tubing, about 1 foot long, fastened into the tube of the funnel when the arrangement is ready for use. The internal diameter of this tube should be, *at the most*, $\frac{3}{8}$ of an inch. A tube similar in shape to Weil's filtering tube, but of different dimensions, looks more elegant and meets the objection against bringing the filtered liquid in contact with India rubber. The upper wider part is 3 inches long, the lower narrow part is made of a barometer tube, and of the length first named. This little device meets moderate expectations very well, and will often be found a good help.

For washing out precipitates, on a larger scale, I use large funnels, half filled with coarse glass powder (glass heated to redness, thrown into cold water, powdered and the finest powder sifted off), on the evened surface of which is placed a round piece of filtering paper, in close contact with the sides of the funnel, for the reception of the precipitate. As a receptacle, I use a Woolf's bottle of proper size; the filtering pump has an evacuation-tube of 12 feet length.

SOLUTION OF HYDROBROMATE OF QUINIA FOR HYPODERMIC INJECTION.

BY WILLIAM SILVER THOMPSON.

The commercial "bromide of quinia" is not sufficiently soluble to make a concentrated solution for hypodermic use; and having been requested by Prof. William T. Howard, to prepare such a solution, containing four grains in twenty minims, or ninety-six grains in each fluidounce, I, at first, availed myself of the reaction between quinia sulphate and calcium bromide, but not being satisfied with the process, I devised the following, which has since been used with success, and gives a satisfactory result:

Take of Quinia sulphate, . . . 96 grains.
Distilled water,
Diluted sulphuric acid,
Water of ammonia, and
Hydrobromic acid, of each a sufficient quantity.

Dissolve the quinia sulphate in four fluidounces of distilled water, with sufficient diluted sulphuric acid. Mix one hundred and fifty minims of water of ammonia with four fluidounces of distilled water, add to the solution of quinia, constantly stirring, and transfer the whole to a muslin filter. The solution of ammonium sulphate, which passes through the filter, should be tested, and if the presence of quinia is indicated, add a little more water of ammonia to the whole of the solution and return it to the filter.

After the quinia is drained, wash it with distilled water; transfer the moist magma to a tared capsule and add, gradually, just sufficient hydrobromic acid to dissolve it. Evaporate the solution thus obtained on a water bath until it is reduced to a transparent mass, the weight of the quinia hydrobromate is thus ascertained, while, at the same time, any excess of hydrobromic acid is driven off.

Lastly, dissolve the mass in a sufficient quantity of distilled water, so that each fluid drachm shall contain twelve grains. The resulting solution will measure about one fluidounce.

Baltimore, Md., June, 1876.

NOTE ON SPIRIT OF NITROUS ETHER.

BY J. U. LLOYD.

The attention of every one connected with the drug trade must frequently have been directed to the various prices of the different spirits of nitrous ether thrown upon the market. Very often it can be purchased for less than the actual cost of the ingredients composing the U. S. P. article.

In September, 1874, I examined several specimens of the commercial article, all of which proved to contain a large amount of water. The specific gravity of four samples were .890, .910, .930 and .940. The U. S. P. directs it to be .837.

I believe it is generally understood that the substitution of water for alcohol, in making sweet spirit of nitre, governs the price of the article, and not the proportion of nitrous ether; that the manufacturer who sells spirit of nitre at less than the cost of production for pure, decreases the alcoholic strength of his preparation proportionately, and for every cent of deduction takes out a cent's worth of alcohol and substitutes water in its place. What is the meaning of the terms 3f.

and 4f. so generally used? The expressions are not recognized by the "Pharmacopœia;" there is no authority upon this subject in any standard work with which I am acquainted. They are merely expressions, denoting that one is more largely adulterated with water than the other. An increase or decrease of ethereal strength to any reasonable degree will not materially affect the cost of production, and, as far as I can learn, water in 4f. nitre, and more water in 3f. explains their meaning.

Undoubtedly, manufacturers accommodate themselves to circumstances. A certain profit must be made. The nitre is adulterated in accordance with the price at which it is sold. But, perhaps, spirit of nitrous ether may be adulterated fifty per cent. with water, and not be altered in regard to its ethereal strength, as is well known, the distillate is much stronger than necessary, and is directed, by the U. S. P., to be mixed with alcohol to reduce its strength. Some think that water, substituted for alcohol, merely changes the form of the diluent; that alcohol only serves the purpose of a diluent, and water will do as well and be inexpensive. I have no doubt many manufacturers conscientiously believe the therapeutical value of the article is not altered in the least by this subterfuge. Experiments, instituted by myself, with a view of finding if this really is the case, demonstrate, to my satisfaction, that the addition of water causes the spirit to decompose very much faster than is the case where the U. S. P. is adhered to.

Nitrous ether, as is well known, rapidly disintegrates, forming acetic acid, nitric acid and other products. Alcohol exerts a preservative influence over it; water hastens the change. I will not intrude upon the time of the reader by giving a full description of my experiments. I will only say that all the specimens examined, upon the market, marked 4f. and 3f. spirit of nitrous ether, contained water and were strongly acid. Upon making the ether perfectly free from acid, distilling it in an atmosphere of carbonic acid, and diluting it with water and alcohol, in different proportions, I found that decomposition proceeded faster with the specimens containing water. The more water the more rapid the change. (See also Thénard's results, in "Gmelin's Chemistry.")

I believe manufacturers should take the matter in hand, and discountenance the substitution of even the smallest amount of water, and

endeavor to make the preparations upon the market conform to the requirements of the "Pharmacopœia." I have not spoken about the etherial strength of the commercial articles. This I believe to be unnecessary while the stuff is made as it is, for even if the full amount of nitrous ether is present when the article is sold, it will not long remain reliable while in contact with twenty-five or fifty per cent. of water. I do not wish to be understood as saying that every manufacturer is making adulterated spirit of nitre. I believe, however, that one hundred pounds of the adulterated article is sold upon the market to one pound of pure. Let our retail druggists, over the country, test the preparations upon their shelves and judge for themselves, and let us endeavor, in some manner, to reform this disreputable business; for such I must consider it until convinced that the U. S. P. is wrong in directing the specific gravity of spirit of nitrous ether to be .837.

POWDERED DRUGS UNDER THE MICROSCOPE.

BY MARK W. HARRINGTON, M. A.

Assistant Professor of Botany in the University of Michigan.

(Continued from page 246.)

2. TAPIOCA (Fig. 2).

A starch from the root of *Manihot utilissima*, a poisonous plant of the Spurge family, from South America and the West Indies.

The grains are unusually compound, the two, sometimes three or four, grainlets of which are generally separated from each other in the preparation of the article for market. The grainlets differ considerably with the direction from which they are viewed. From the side, they appear rounded at one end, cut off at the other, and contain an apparently conical cavity, of which the nucleus is the apex and the flat side of the grain the base. Seen from the end, the grains appear circular, with a round, central nucleus. The layers are not distinct, though sometimes one or two can be made out. The diameter of the grains varies from 1*tt.* to 16*tt.*



FIG. 2. Tapioca starch.¹

The tapioca of the markets is in small, white masses, tough, slightly elastic, odorless, and with a slight taste. The grains of starch are distorted, more or less, by the heat used in the preparation of the article. A careful examination, however, will show many grains of the original form.

¹ Figures 2 and 3 are taken from Vogl's "Nahrungs- und Genussmittel"; the remainder are by Miss Reed.

Several other species of *Manihot* are said to furnish a part of the tapioca in the trade. Their starch-grains are much like those just described, and, in the present state of our information, it is not practicable to distinguish them.

Tapioca is said to be adulterated with potato, sago and wheat-starch. It is, itself, used as an adulterant of arrowroot.

3. SAGO (Fig. 3).

The starch from the stem of several species of palm-trees, generally *Sagus Rumphii*.

The grains are ovate or oval, with the margins sometimes slightly concave. The rings are evident, and there is a round or star-shaped nucleus nearest the larger end. Many of the grains are singularly compound, consisting of a large grain, with one or more much smaller ones forming protuberances on it. In commercial specimens, the grainlets of the compound grain are usually separated from each other, and show only the flat-



FIG. 3. Sago starch.

tened surfaces where they were in contact. The length of the grains is from 7 μ t. to 24 μ t., usually above 14 μ t.

Granulated sago is made into small, round masses by being passed through a sieve and subjected to heat. The masses are brownish in color. The starch-grains are but little altered by heat.

Pearl sago is in larger, white, spherical masses, which in the course of preparation have been subjected to considerable heat, and afterwards bleached. The grains of starch in this case are swollen and distorted, and the nucleus is bulging.

The principal adulteration of sago is by means of potato starch. From it a false sago is made, which resembles the real article very closely. The microscope will readily show the difference between them. Sago is employed as an adulterant of several other starches.

4. ARROWROOT, OR MARANTA (Fig. 4).

The starch from the root-stock of *Maranta arundinacea* and, perhaps, other species of the same genus.

It is a powder, with small scattered, irregular masses, of a dead-

white color, but glistening a little when examined closely, crackling slightly when rubbed, inodorous and insipid.

The grains are simple, egg-shaped, or oblong. The rings are fine and concentric or eccentric. The nucleus is large, shaped like a point, or a slit crossing the grain or two slits crossing each other. It is in the center, or nearer the larger end of the grain. The length of the grains is from 1*tt.* to 24*tt.*

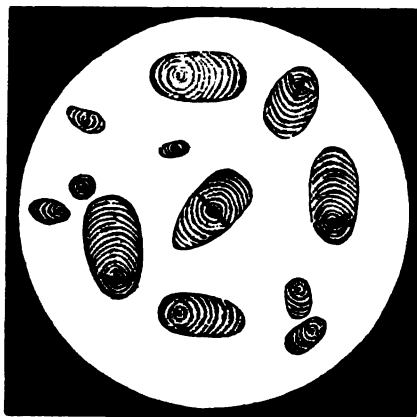


FIG. 4. *Maranta*.

Other varieties of arrowroot are described, from the European trade, though the writer has never seen them in the United States, with the exception of potato-arrowroot, which is occasionally found. It can be easily distin-

guished by the examination of the starch-grains already described.

Curcuma arrowroot is known by starch-grains which are rather larger than those of *maranta*, and which have the nucleus on the margin of the grain, frequently on a projecting point. *Canna*-arrowroot, or *tous les mois*, consists of starch-grains from 16*tt.* to 50*tt.*, which are therefore about twice as long as the grains of *maranta*. The larger grains are flat and more or less egg shaped, with the nucleus near the smaller end. The concentric lines are fine, regular and very numerous. *Tacca* or *Tahiti* arrowroot consists of grains 4*tt.* to 15*tt.* long, and shaped much like the grains of sago-starch. They are partly convex, partly with flat surfaces, rather hemispherical or pear-shaped. The nucleus is nearly central, and star-shaped. *Arum* or *Portland* arrowroot consists of very minute grains, something like those of *Tacca*, but only 1*tt.* to 8*tt.* in diameter.

The above can be considered in the light of commercial varieties. Fraudulent substitutions or adulterations of *maranta* with any of the cheaper starches may be expected. Potato, sago and tapioca starches are especially used for this purpose.

5. *AMYLUM* (Fig. 5).

Under this name, the "U. S. Pharmacopœia" calls for wheat-starch,

that is, starch taken from the grain of the cultivated wheat. As a matter of practice, pharmacists usually sell corn-starch under this name. As the latter, when well prepared, is an excellent article, perhaps superior to wheat-starch, there is no objection to this substitution, if it is well understood.

Wheat-starch is in slender, brittle, irregular prisms, or in a powder. It is of a dead-white color, odorless and insipid. Like most starches, when rubbed between the fingers it crackles slightly.

The grains are of two sizes, with but few intermediate. The larger ones are lens-shaped, and present only indistinct traces, if any, of nucleus and rings. When these do appear, the former is central, the latter concentric. They are from 14 μ to 16 μ in diameter. The smaller grains are spherical, and usually less than 3 μ in diameter.

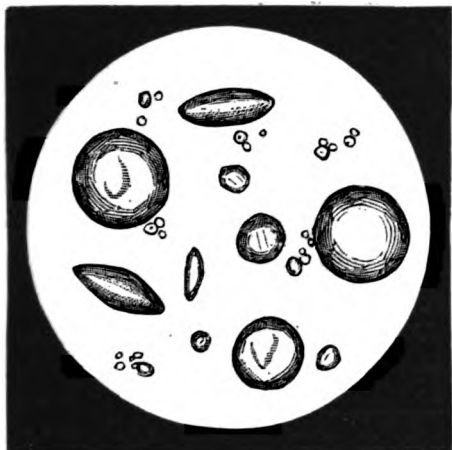


FIG. 5. Wheat starch.

The starch grains of rye and of barley are much like those of wheat, and it is sometimes desirable to distinguish them. In rye, the larger grains are from 16 μ .

to 21 μ in diameter, and have frequently a distinct star-shaped nucleus, while the smaller are decidedly smaller than those of wheat. In barley, the larger grains are about 11 μ in diameter, with, often, rings and nucleus, while the smaller grains correspond closely to those of wheat.

Wheat starch is a prominent constituent of "Imperial Granum," "Baby's Cereal Food," Ridge's "Cereal Food," and many similar proprietary substances. They are powders of no great complexity, and the determination of their constituents would be excellent practice for the pharmacist inexperienced in this line of his work.

6. CORN STARCH (Fig. 6).

This starch is derived from the grain of corn, and comes in a form like that of wheat starch: Its powder, however, is glistening, while that of wheat is dull.

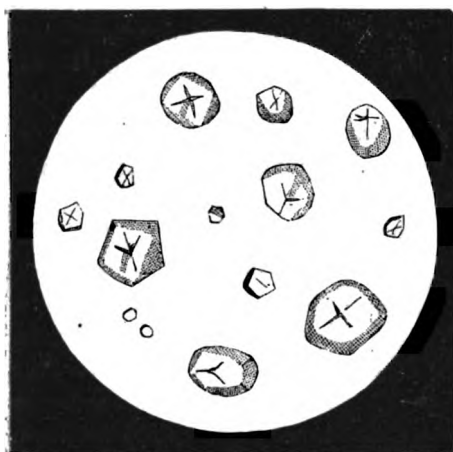


FIG. 6. Corn starch.

The grains of starch are quite small, not surpassing 12 μ ., and usually lying between 6 and 9 μ .. They are simple; the general shape is spherical, but the sides are more or less flattened, and the grains misshapen by mutual pressure. In the starch from the central white and mealy part of the kernel of corn, the grains have more flat sides, due to the greater pressure; while in the more hyaline outer part of the kernel, the starch grains are rounder. There are no rings visible. The nucleus is central, and is a round point in the fresh starch grain, star-shape in that which has been dried.

Corn starch is extensively sold under the names of "Maizena," "Maizone," as well as that of *amylum*.

ANALYSIS OF FACE LOTIONS.

BY GEORGE JOSEPH MITSCH, PH.G.

(From an *Inaugural Essay*.)

The author selected Hagan's Magnolia Balm and Laird's Bloom of Youth for his analysis. Both are put up in opaque white glass bottles, and consist of a liquid precipitating a white sediment on standing, which is readily suspended again on shaking.

One bottle of Hagan's Magnolia Balm was found to contain 3½ fluidounces of liquid and 262 grains of insoluble portion. The clear filtrate was not acted upon by either sulphuretted hydrogen, sulphhydrate, carbonate or phosphate of ammonium, and on evaporation left two drachms of a syrupy residue which was proven to be glycerin. The insoluble powder was dissolved in hydrochloric acid with effervescence. The solution was not precipitated by sulphuretted hydrogen, but after having been rendered alkaline by ammonia, with which

it yielded a clear solution, gave a white precipitate with sulphhydrate of ammonium. The precipitate was zinc, and the filtrate, when evaporated and ignited, left no solid residue. Carbonic acid was the only acid found in the powder, which had been colored with $\frac{1}{2}$ grain of carmine. The liquid was flavored with lavender and bergamot.

One bottle of Laird's Bloom of Youth was found to contain $2\frac{1}{2}$ fluidounces of liquid and 212 grains of insoluble powder. Tested in the usual manner, the liquid responded to the tests for small quantities of iron and calcium, and on evaporation left half a fluidrachm of glycerin. The powder was dissolved in hydrochloric acid, effervescence being produced, and the solution treated with sulphuretted hydrogen, which produced a black precipitate, due to bismuth. The filtrate treated with ammonia and sulphhydrate of ammonium, gave a white precipitate, due to zinc, and the filtrate from it yielded, with ammonium carbonate, a white precipitate, due to calcium.

Besides carbonic acid, the presence of hydrochloric acid was proven in the nitric acid solution by silver nitrate.

A quantitative estimation of the insoluble portion yielded—

31.204 grains of	oxychloride of bismuth,
129.792 " "	carbonate of zinc,
50.004 " "	carbonate of calcium.

Total 211.000 grains; actual weight, 212 grains.

The powder was colored with $\frac{1}{2}$ grain of carmine, and the liquid was perfumed with lemon and bergamot.

AGAVE AMERICANA LIN. AND ITS USES.

BY FRANCIS MARION MURRAY, PH.G.

(Abstract from an Inaugural Essay.)

To the curious and interesting plants of the genus *Agave*, the name *Century plant* was given from the gardener's fable of its requiring one hundred years for them to produce their flowers. That they flower but once in a century is true, since they propagate their species by flowering but once, when they wither and die.

Being indigenous to tropical America, and from the fact that they were for many years confounded with the genus *Aloe*, the plants of which, when young, may be mistaken for them, they have received the general appellation—*American Aloe*.

The generic name "altered from the Greek, *ἀγανός*, wonderful, is not inappropriate as applied to *A. Americana*" (Gray), or to the *A. pulqué*, or *Mexicana*, which has for many centuries been known to the Mexicans as the *Maguey*, or *tree of wonders*.

The term, "Sisal hemp," is more especially applied to the species *Americana*; Sisal, Yucatan being the principal port of exportation for the fibre or hemp prepared from the leaves.

This evergreen multennial of the order *Amaryllidaceæ*, produces from the crown of a very short cylindrical base a vast cluster of fleshy, stiff, oblong-lanceolate leaves, having short spines on the edges, and terminating in a strong black spine. The leaves are from 3 to 8 and even 10 feet in length, the first being the shortest, from 3 to 7 and even 15 inches in width, and 1 to 4 inches or more thick.

After the growth of the plant has sufficiently advanced and nearly all the leaves have unfolded, there pushes forth from the center, with rapid growth, a gigantic flower-stalk, from 3 to 8 inches in diameter at the base, which, in Florida, reaches the height of from 15 to 30 feet within a few months. When this shoots up, it carries with it the small innermost leaves, which at regular intervals are produced as appressed, lanceolate-pointed bracts. These bracts are from 4 to 6 inches apart on the lower part of the stalk, becoming closer together as it increases in height, until at the extreme top they quite adjoin each other.

The upper third of the stalk is branched, each branch, or arm, being repeatedly divided into three branchlets, the branches becoming gradually shorter above, so that the inflorescence presents the form of a circular pyramid of perfect symmetry, each branchlet bearing a cluster of small, erect liliaceous flowers, of a greenish-yellow color.

A surprising fact is, that the roots of so large a plant should be so few and small, being apparently insufficient to retain it in an upright position. They are cylindrical and wavy, $\frac{1}{8}$ to $\frac{1}{4}$ inch in thickness, 6 to 24 inches long, having a thin, brownish epidermis, under which is a second thin tissue of a deep red color; the rest consisting of a bundle of strong white woody fibres, with little parenchyma. All the roots of a full-grown plant will scarcely weigh 4 ounces.

It is propagated by seeds and suckers, both being produced simultaneously. It is viviparous, the seeds *always* germinating on the plant. The young plant, or "onion," as it is called, frequently grows 4 to 6 inches high before dropping from the parent plant. Mr. E. C. Howe,

of Key West, Florida, informs me that he has counted as many as 2,000 onions on a single plant; the average number is 1,000. The suckers are comparatively few.

The author is of the opinion that the Agaves generally are viviparous, and states that on the island of Key West there are three rather marked varieties. First, the common green American aloe, with but few marginal spines; 2d, the same, with narrower and more spinous leaf; 3d, a very spinous variety, having a broader leaf than either, and a bright silvery-green color. John Ambercrombie, in "A Gardener's Pocket Dictionary," vol. iii, enumerates a variety having a gold-striped leaf. When young, the plants seem to be equally spinous, but in the course of development the spines on the common green variety gradually disappear, until, when the plant has matured, the leaf margins are almost uninterrupted. The other varieties retain their spines.

This august plant flowers in from 2 to 10, 50 or more years, according to climate and soil in which grown, and attention received. Mr. Howe has, by careful culture, caused the flower-stalk to shoot up in two years from the time the young plant dropped from its parent. On Key West Island there is an area of about seven acres covered with *A. Americana*, growing in soft rock of oölitic formation, covered with a thin layer of recent humus. The plant is uncared for, and flowers in from 5 to 8 years.

It usually requires about 8 months after the flower-stalk makes its first appearance for the plant to attain its full growth, immediately after which it begins to wither and soon dies, stem, leaves and roots.

The author cites from "Amer. Journ. Sc. and A.," 1833, a letter from Henry Perrine, then U. S. Consul at Campeche, and the statement of M. Bazire, with which he concurs, in assuming the species yielding the pulqué of Mexico to be distinct from *A. Americana*, which grows well in sandy or calcareous soil near the sea level. The differences may, however, to a great extent be due to long-continued cultivation, which may have caused the coarse fibres of the leaves to disappear under the effect of rich soil and genial temperature.

A. Americana is indigenous to the intertropical region of America, and has been introduced into most sub-tropical and warm, temperate climes of the earth. It was brought to Key West by Mr. H. Perrine in 1838, and was then introduced to Indian Key, Cayo Largo and the

main-land, where it grows as far north as lat. 28°. It grows also in Southwestern Texas and Southern New Mexico.

Uses.—The growing plant is used for hedges; the dried flower stems constitute a thatch, perfectly impervious to the heaviest rain, and split longitudinally, the stem makes an excellent substitute for a razor-strop. But the most important part of the plant is the fibre of the leaf. This is rather coarse, silky-white, harsher and not quite so strong as manilla, but makes beautiful, clean, glossy cordage. The “yashqui,” or prickless (common green) variety is most used for this purpose. The reason why such a comparatively small quantity of this excellent fibre has been thrown into the market, is because of there being, as yet, no ready means of separating the pulp from the fibre.

The rude mode of bruising and steeping the leaves in water, and afterwards beating and shaking the pulpy matter off, is very slow and unsatisfactory. Dr. Mease tells us that in Yucatan it is prepared “by means of two sharp corners, made by hollowing out the ends of a wooden tool like a flat ruler; the fleshy leaves are slit in two or three longitudinal strips, and the pulpy substance being scraped off, the fibrous material appears, which is then shaken loose, tied in a knot, and, when dried in the sun, is put up in bales for exportation.” Several machines have been invented for separating the fibre; the most efficient is one by Mr. G. D. Allen, of Key West, but he found much difficulty in ridding the leaf, in an expeditious manner, of a thin epidermis, which adheres closely on both sides. His idea was to express the juice by passing the leaves between steel rollers, ferment the juice for the 10 per cent. of alcohol which it will yield, place the expressed leaf in water for three or four days, dry, shake-off the pulp and utilize it for manure, and clean the fibre for cordage. But, being too far from a market, he was compelled to abandon it, after having sustained heavy losses. One stalk, or plant, produces from 75 to 100 leaves fit for cutting, and thirty tons of green leaves make one ton of fibre. The fibre is finer and easier separated before the flowering stalk shoots up. “Great quantities are sent to Cuba to make coffee-bags, and since 1825 numerous cargoes have been imported into the United States, and worked up into hawsers, running-rigging and small ropes” (Dr. Mease). Also, a coarse kind of “thread, twine and hammocks are made from the fibre. The ancient Mexicans made from it a coarse kind of paper, and the Indians use it for oakum.” (Chambers’ Cyclop.) “The

leaves are employed for scouring pewter, kitchen utensils, floors, etc. In Algravia, when pasture is scarce, they are cut in thin, transverse slices, and fed to cattle" (Rees). On the island of Key West, in very dry season, cattle chew the leaves for thirst. Chickens eat the inner-tender leaves with avidity. The juice has a bitter, mucilaginous, somewhat nauseous taste, a turbid green color, and an odor that is truly the "stinkingest of the stinking kind." It passes very rapidly from vinous to acetous fermentation; yeast, raisins, whiskey, etc., have been used with little retentive effect. It seems all that is necessary to make "century plant" cultivation a very lucrative business is something to produce rapid and permanent vinous fermentation. It ferments in about 30 hours after expression. The average amount of juice yielded is 2 ozs. per leaf, which, strained and evaporated to a thick consistence in the sun, may be made into cakes or balls with ashes, and used for washing; they will lather with salt as well as fresh water.

Dr. G. Perin, of the U. S. Army, has found the juice to be an admirable remedy in scurvy, and it is much lauded by Mexican sailors as an antiscorbutic. The pulp, made into an ointment, was recommended by Lenoble as an epispastic, and has been used in veterinary practice as a rubefacient. Laxative, diuretic and emmenagogue properties have been attributed to the juice.

CONCENTRATED SOLUTION OF SALICYLIC ACID.

BY C. L. MITCHELL.

(*Read at the Pharmaceutical Meeting, held June 20th.*)

A strong solution of salicylic acid, for convenience in both dispensing and prescribing, has long been a desideratum, and until recently no practical way of overcoming the difficulty has been known.

Salicylic acid itself is very sparingly soluble in cold water, and though readily dissolving by the aid of heat, nearly all separates on cooling. Its alcoholic solution is not adaptable to the purpose—for when diluted with water, the acid immediately separates.

Various methods have been recommended for rendering the acid more soluble, namely: the use of various salts, such as sodium orthophosphate, calcium chloride, ammonium acetate, etc.; and also by dissolving it in glycerin. None of these modes of procedure give a solution which contains more than $\frac{1}{2}$ per cent. salicylic acid. The desideratum

seems to be a concentrated solution which will bear dilution with water to any extent. Recently, a writer in the "Druggists' Circular," has recommended the use of sodium biborate and glycerin in the proportions of 1 part each of salicylic acid and the biborate to 16 parts glycerin. This gives a solution containing about 6 per cent. salicylic acid, and is freely miscible with water in all proportions.

While recently experimenting with this formula, it occurred to the writer that probably a still stronger and more concentrated solution might be obtained by some slight modifications. After several experiments the following formula was adduced :

Acid, salicylic, pur.,	3j
Sodii biborat.,	3j
Glycerinæ,	q s.

Mix the acid and borax with f3iv glycerin, heat gently until dissolved, then add q. s. glycerin to make the measure f3i. This solution contains 25 per cent. salicylic acid, and can be diluted with either glycerin, alcohol or water to any degree desired.

The advantages of a concentrated solution of this description can scarcely be overestimated, as it affords a very convenient mode of both prescribing and dispensing salicylic acid.

June 20th, 1876

ON SALICYLIC ACID.

BY CHARLES BECKER.

The addition of the phosphates of ammonium or sodium has been recommended to increase the solubility of salicylic acid in water, but these agents really amount to but very little, as a solvent of 1 part of the acid in three of either phosphate, and fifty parts (by weight) of water throws down a precipitate in less than twenty-four hours. An addition of two parts of sulphite of sodium to one of salicylic acid, in fifty parts of water, precipitates in a few hours. Borax in the proportion of two parts to one of salicylic acid, and fifty of water, precipitates slightly after twenty-four hours; a solution of one part each of salicylic acid and borax, in five parts of glycerin and twenty-five of water, is permanent; while the same proportion of borax, acid and glycerin, in fifty parts of water, will precipitate after twenty-four hours. A solution of one part of acid to two of borax, in twelve parts of glycerin, made with heat, is permanent; but when one part of this solution is



RHEUM OFFICINALE, *Baillon*.

From *Neues Repertorium*, 1876, January.

diluted with three parts of water, which makes it two parts of salicylic acid, four of borax, twenty-four of glycerin and ninety of water, a cloudiness appears in a few hours. One part of salicylic acid with one part of water of ammonia (20°) forms with ten parts of water a permanent solution;—this has a light-brownish color, a very faint odor of ammonia, a very distinct, sweet taste of the acid, and a slight acid reaction on litmus paper.

Salicylic acid is soluble in ten times its weight of dilute alcohol, at a temperature of about 80° F., in one and a half times its weight of alcohol (0.835 sp. gr.), and in twice its weight of sulphuric ether. It is nearly insoluble in cold oil of turpentine, but hot turpentine dissolves about 5 per cent. of its weight. Its alcoholic solution has a decided acid reaction on litmus paper. An addition of one-fifth of 1 per cent. of salicylic acid to aqueous infusions will preserve them for weeks; and the same proportion added to syrups made with fruit juices, while it will not arrest fermentation after such has set in, will prevent the same.

The acid used in the above experiments was of Schering's make, and perfectly white and inodorous.

When one part of salicylic acid and two parts of olive oil are heated together they form a homogenous mixture, admirably adapted for application to surfaces. The oil will separate to some extent on standing for a time, but agitation will easily combine it again.

REMARKS UPON RHUBARB AND RHEUM OFFICINALE.

BY F. A. FLÜCKIGER.

In recent years the French missionaries have gained the advantage of being able to seek for the rhubarb plant in Southeast Thibet, and already in 1863 the apostolic vicar of the district, Monseigneur Chauveau, knew where to procure it. But it was in 1867 that Dabry, the French Consul at Hankow, was first able to forward to the Society of Acclimatization in Paris a living root, which, although it arrived in a very bad condition, was, through the care of the Secretary, Dr. Soubeiran, grown in the garden of the Medical Faculty. The plant was at once recognized by Baillon as belonging to a new species which was described by him in the "*Adansonia*."¹ After the plant had flowered,

¹"*Adansonia*," x (1868), 246. Descriptions appeared in this journal 1872, p. 546, and 1874, p. 154.

the description was supplemented by a figure in the "Proceedings of the Association Française pour l'Avancement des Sciences," for 1871. It was also figured in the "Botanical Magazine," 1874, t. 6135.

In the summer of 1874 the author received roots from the late Mr. Daniel Hanbury, and in 1875 the plant flowered for the first time in Germany in the garden of the Pharmaceutisches Institut of the University of Strassburg, forming a stately, elegant plant. The flower stalk reached its full height about the 25th of May, when the flower, which was at first almost horizontally drooping, appeared. The flower opened on the 27th of May, and on the 9th of June it stood upright, and was in full bloom. In this case it was not, however, as described by Baillon, "*pallide virescens*," but white. Fruit had appeared on the 20th of June, and by the 26th the flowering had nearly ended and the stalk had attained its greatest height, $2\frac{1}{2}$ metres. Most of the fruit was ripe on the 20th of July, but the quantity in proportion to the number of flowers was small. Professor Flückiger says the flower and fruit of *Rheum officinale* present no characters which distinguish it from other species of *Rheum*.

At the author's request, Mr. Hanbury also distributed the *Rheum officinale* to Messrs. Rufus Usher & Sons, the owners of the large rhubarb plantations at Bodicott, in Oxfordshire, the rhubarb cultivated there being probably *R. Rhaponticum*. Professor Flückiger has now had an opportunity of comparing a root of *R. officinale* grown by himself with one of the gardens of the Paris School of Pharmacy, supplied by Professor Planchon, and one obtained by Messrs. Usher & Sons, and treated and dried in the same way as their rhubarb for the market is usually prepared. After this comparison, Professor Flückiger is able to say that the root of *R. officinale* undoubtedly bears the characters of true Chinese rhubarb, and he thinks that with suitable treatment it would yield a product identical in external appearance.

The first epidermis of the subterranean portion of *R. officinale* is remarkable for a very bright brown-red color; the roots of other species, at any rate those of *R. Rhaponticum* and *R. Emodi*, are only yellowish or yellow-brown. But what still more distinguishes *R. officinale* is the strong development of the root-stock, a large part of which occasionally projects conically from the ground, and is provided with not very numerous setondary roots of the thickness of a finger. Only the root-stock approaches the marbled structure of the true rhubarb; the sec-

ondary roots show the ordinary regular structure of this kind of axis, and no trace of the star-like spots or knots which give the drug its special appearance.

Dr. Schmitz, of Halle,¹ was the first to point out the signification of these knots, and to show that the official rhubarb is a root stock, which for one year grows as a tuberous, thickened short stem, producing a flower-stalk that dies off completely, and that on this short stem appeared numerous lateral buds that grow in a similar manner to the stem from which they are produced. The knots, however, which Dr. Schmitz looks upon as starting from the medulla, appear, Professor Flückiger thinks, to be related to the vascular bundles of the leaf. In consequence of the close arrangement of the leaves round the root-stock the irregular net-like interwoven fibres stand very close together, so that a tranverse section at the base of the leaf-stalks also give the characteristic circular distribution of the knots. The fibres increase in thickness independently, the inner portion of each separate knot consisting of parenchyma, which behaves as bark tissue, and is surrounded by a cambium ring. Outside the latter the fibre has the character of the woody portion (xylem) to the extent that well perfected vessels appear in it.

The knots are, however, by no means peculiar to the true official rhubarb, as they appear also in the so-called European rhubarbs. But there is this very great difference, that they are to be found much more plentifully and in a dense though irregularly arranged zone in the true officinal drug as well as in the root-stock of *Rheum officinale*. But a small number of isolated knots occur not unfrequently in the French or English rhubarbs. This fact led Schmitz to say that the root-stock of *R. Emodi*, Wallich, also possesses the characteristic markings of true Chinese rhubarb, a statement that the author thinks needs limitation. Especially, a remark connected with this, that probably a portion of the Himalaya rhubarb obtained in the country of *R. Emodi*, might be derived from that plant, is, Professor Flückiger thinks, put beyond consideration by the fact that no Himalayan rhubarb occurs in European commerce. After careful consideration of the English and Indian markets, Flückiger and Hanbury felt bound not to perpetuate the name "Himalayan rhubarb" in their "Pharmacographia." Together with innumerable other drugs, probably the roots of *R. Emodi* and other

¹ Session of the Naturforscher Gesellschaft at Halle, Dec. 12, 1874.

nearly allied species which grow in the Himalayas and Thibet, are to be met within the Indian bazaars, and once a couple of chests of such Himalayan rhubarb strayed to England. These, however, as well as authentic pieces of the root which were supplied by Wallich himself, were deficient in the characters of true rhubarb.¹ Practically, therefore, we have no varieties of rhubarb from the Himalayas. The brothers Schlagintweit, in their journey through the western part of the Himalayas, met with *Rheum Emodi*, *R. Moorcroftianum*, Wall., and *R. australe*, Don., but not with the collection or cultivation of true rhubarb.²

Similar with respect to the rhubarb of present commerce, opinions are not wanting that it should be considered different from the so-called Russian rhubarb. Thus, Berg is of opinion that this drug, at present disappeared from commerce, should be attributed to another plant which has sometimes been indicated as *R. palmatum*. To the author's knowledge, however, no *Rheum palmatum* cultivated in Europe has yielded roots resembling the true drug. But, in 1872, what appears to be a more nearly allied plant was collected by Przewalski in the highlands of Tangut, near the salt lake of Kokonor, in the province of Kansu (lat. 37° N., long. 100° E.), and described by Maximowicz as *Rheum palmatum*, var. *Tanguticum*. According to the Russian botanist, this plant, which is now cultivated at Erfurt, in Germany, is the plant from which the once preferred Russian rhubarb was derived. Professor Flückiger, however, thinks that a decisive opinion upon the relation of this *Rheum Tanguticum* to *R. palmatum*, at present cultivated in European gardens, on the one hand, and *R. officinale* on the other, is not at present possible; Tangut and Thibet lie so far asunder, that some experience in the propagation of these two plants is desirable.

This uncertainty imparts interest to the notices of the origin and commercial routes of the rhubarb coming into European trade that have accumulated in the course of time. It appears probable that the Chinese, in the thousandth year of their annals, which is earlier than our chronology, employed rhubarb, and that very early caravans went from Central China to Western Asia, to Bokhara, for instance, so that it is possible that rhubarb spread westward in very early times. Acquaintance with it in India in ancient times cannot be determined, inasmuch as the Sanscrit language has no word to describe it. With the ques-

¹ Pereira "Elements Mat. Med., II," part i (1852), p. 492.

² "Annales des Sciences Naturelles (Botanique)," vol. vi, p. 334.

tion whether the *Rba pontica*, *Rba coma* or *Rba* of the later Latin writers was the drug of to-day, Professor Flückiger does not deal ; but he thinks the expression *Rheum barbarum* or *barbaricum*, first appearing in the sixth century, certainly relates to our drug, and this name appears to have gradually supplanted *Rba ponticum*. Probably it is spoken of in the great geography of China, "Taïhsing-i-thoring-tchi," when it is said that rhubarb, "taï hoäng," a product of the province of Sining-fu [east of the Sea of Koko-nor, already mentioned, in the present province of Kanzu], was admitted into Tangut during the rule of the dynasty of Tang as tribute from the Kouohtcheou district. This dynasty ruled from A.D. 618 till A.D. 905, just at the time when the name *Rba barbarum* was given to the drug in Europe. If there is not here strict evidence of the identity of the Chinese drug, Taï-hoäng, *i. e.*, the great yellow [root], with *Rba barbarum*, the author thinks there is the highest probability.

Esdrisi, the Arab geographer of the middle ages, in his "Geography," written in 1154, and based on oral communications from travelers and the literature of the time, says of a certain district, "It is also there that the Chinese rhubarb grows, and the root is found there in abundance ; it is exported to many oriental and occidental countries." The district indicated was the mountains near Buthink, where, according to Esdrisi's account, the nardus (*Nardostachys jatamansi*, D.C.) also grew, and the musk deer lived. Professor Sprenger refers the notice to the district lying between Hlassa and the Tengri-nor, the great mountain-lake of Northeast Thibet.

"Reubarbe" is found entered among a large number of North Asiatic and Indian products in the customs list of St. Jean d'Acre (1173 to 1183). In a note on Marco Polo's Travels (Leipzig, 1855), Bürk speaks of entire loads which the Dschingiskhan troops met with at the conquest of the town of Lingscheu (or Lant-scheu-feu), east of Sining in 1227, and which were very acceptable. Wilhelm von Ruysbrock (Rubruquis), who, in 1253 in the service of King Ludwig, reached the court of the Mongol Khan Mangu, found there "reubarba" in frequent use, though he did not reach further than the Karakorum mountains. Twenty years later, the famous traveler Marco Polo pressed much further eastward, and especially among other places to Tangut, to which province so many notices on rhubarb refer it. In speaking of Suctur, the present province of Kanzu, Marco Polo says :

"La grant province general, où ces trois provinces sont, est Tanqut. Et partoutes les montagnes de ces provinces se trouve le reobarbe in grant habondance. Et illec l'achotent les marchans et les portent par le monde." And further, "Ci dict de la cité de Siguy : Siguy est une très noble cité et grande. . . . Et si y a si grant planté de gent que l'on n'en puet savoir le nombre, . . . mais ils ne sont point hommes d'armes, ains sont marchans et gens moult soubtilz de tous mestiers. Et si a en ceste cité moult de philosophes et moult de mires [médecins?]. . . . Et es montaignes de ceste cité croist réobarbe et gingembre aussi a grant planté." Professor Flückiger does not think with Pauthier, Marco Polo's editor and commentater, that by Siguy is to be understood Su-tscheu in the province of Kiang-su, but Sining in the western part of the province of Schen-si. The doubt remains, how it was possible that ginger (gingembre) could occur together with rhubarb; but that rhubarb was wanting in the comparatively well-known province of Kiang-su is certain.

As a Venetian, Marco Polo naturally turned his attention to rhubarb. It is known that the Venetians as well as their neighbors the Genoese obtained supplies of Asiatic products not only through the Red Sea and across Egypt, but that their commercial routes from Central Asia found an exit also by the Sea of Azov or the Syrian coasts. In this way, possibly, rhubarb may have been supplied when the Sultan of Egypt interposed difficulties to transmit through his dominions.

During the whole of the middle ages rhubarb does not appear to have been a very important article of commerce. "Rabarbara" occurs in the commercial police regulations of the city of Bruges in 1380, as an import from Italy. In 1445, rhubarb was imported into Dantzic from Riga, and it was one of the valuable drugs which, in 1497, were sought in the first doubling of the Cape of Good Hope. The Portuguese and Italians, who reached India at the commencement of the sixteenth century, obtained from Calicut and Cochin rhubarb that had been imported from China *via* Malacca.

Garcia de Orta gives further information respecting the commercial routes which the trade of that time (1563) struck out. It reached Ormuz in the Persian Gulf, made its way through Mesopotamia to Aleppo and thence to Alexandria, where the Venetians took it in hand. Garcia states that rhubarb was supplied direct from Canton to Ormuz.

Like other oriental products, rhubarb appears to have been confined principally to land routes, hence the very high price of the drug. According to Leber, in 1542, a pound of cloves cost 3 livres, pepper 15 sols., but rhubarb 18 livres 15 sols., whilst saffron was only 4 livres 10 sols. In Ulm, in 1596, rhubarb was of higher value than opium.

In the seventeenth century, also, according to a contemporary notice, rhubarb reached Europe by the same different routes "across the Indian Ocean, through the Kingdom of Cascar (Kashgar), through Tary, Astrachan and through Russia, or to Moscow, and finally through the Kingdom of Thibet, Mogor and Persia."

Holland, Smyrna and Constantinople became emporiums for rhubarb, so that not only Russian or Muscovitic, but also Holland and Turkish rhubarbs were spoken of. Gradually this trade was diverted into other courses. Russia entered into treaties with China, and the commerce between the two great empires was concentrated at the market of Kiachta, in Southern Siberia. The good rhubarb henceforth took its way through Siberia and Russia, whilst only the poorer sorts were brought for export to Canton, the only port in China at that time open. The further changes that the commerce in rhubarb have undergone have been described elsewhere.¹

Professor Flückiger then proceeds to glance at the more recent notices which have appeared concerning the countries in which rhubarb is collected. The famous description of the Jesuit mission only states that the native country of the principal kind of rhubarb was the province of Se-tschueu (Suitschuan); also the snow mountains from Sue-cheu to Leang-tcheou; and, lastly, Thibet, where, however, only a poorer root was found. Father J. B. der Halde, to whom we owe this information, bases it upon the testimony of eye witnesses, who do not, however, appear to have given any special attention to rhubarb.

More trustworthy information is given in an account of a journey from Pekin to Sz'tshwan (Oct., 1871 to May, 1872) by F. V. Richtofen, who mentions that amongst the products of the province of Sz'tshwan (or Sui-tschuan, at the head of the great Kiang river) the rhubarb grows wild only on the highest hills. The central line of its occurrence runs through the Bayanksra range (southwest of the salt sea of Koko-nor), where the yellow river (Hwangho) takes its rise. From this range the rhubarb extends through the highlands north and south. In the south

¹ "Pharmacographia," pp. 443-445.

it occurs on the hills in the more immediate neighborhood of Kwan-hien, but the better sorts begin first ten or twelve days' journey further north.

The principal markets for rhubarb are Sining-fu (just as in Marco Polo's time) in Kansu and Kwanhien in Sz'tshwan. That which comes from the first named place is known as Schensi rhubarb, and obtains the highest price, notwithstanding that the inhabitants of Sz'tshwan are convinced that they produce a better sort. In the western part of the plain of Tshing-tu-fu a kind of rhubarb is cultivated in the fields; but it is far inferior to the wild plant which does not allow of cultivation, and resembles that which is produced in the frontier hills between Sz'tshwan, Hupe and Shensi.

Evidently, therefore, the rhubarb plant is distributed through an immense tract of country in the central provinces of China; it is consequently quite possible that several species yield the same drug.

Von Richthofen's statement that the best sorts are obtained from wild plants is remarkable, as formerly it was generally accepted that the plants were cultivated. The contradiction is probably explained in a letter received by Collin¹ from the missionary Biet in 1871, according to which the rhubarb plant succeeds best, at any rate in Upper Thibet, in the land richly manured by cattle surrounding the mountain huts and stables. The same thing may be said of *Rumex alpinus*, so nearly allied to the species of *Rheum*, in the mountains of Germany, where it grows most luxuriantly in such land, although it is not the subject of special culture.

In 1870, the apostolic vicar Chauveau reported from Thibet that the export of rhubarb from that land had almost ceased, and that nobody cultivated it. It appears, therefore, that the principal seat of the rhubarb production must be considered still to lie in regions mentioned in the middle ages. The natural central point for its export is the city of Hankow in the province of Hupe, on the upper Kiang, or Yan-tse-Kiang. Nevertheless, the yearly export from Hankow to Shanghai does not exceed 250,000 kilos, and it is probable that the general consumption of the drug is falling off.

From the foregoing, Professor Flückiger draws the following conclusions:

¹ "Des Rhubarbes" (Paris, 1871), p. 24.

1. In *Rheum officinale*, we possess for the first time a plant, the root-stock of which agrees with the true rhubarb.

2. This kind grows in Thibet, the northeast district of which probably formerly yielded good rhubarb, but appears to do so no longer.

3. Whether *Rheum officinale* occurs in Sui tschuan, Schensi and Kansu, from which provinces the true rhubarb is obtained, remains to be seen.

4. Also, we require more exact information respecting *R. palmatum*, var. *Tanguticum*. The official rhubarb formerly came from the provinces mentioned under 3, at one time by land, at another through Canton, reaching the sea at Ormuz, Syria, Asia Minor or South Russia, according to existing political relations.

5. Only when China became more accessible, this drug took its natural way to Hankow, the chief market of the Chinese Interior, and from thence to the sea.—*Pharmaceutical Journal and Transactions*, 1876, April 29, from *Neues Repert. f. Phar.*, Jan.

SELECTIONS FROM THE DANISH JOURNALS.

BY HANS M. WILDER.

Nitric Acid.—It is customary to reject the first thin distillate which will contain the hydrochloric acid present. O. H. Schytt calls attention to the following method which does away with the trouble of changing receiver and watching the distillate; heat, till dry, in a sand-bath (in a porcelain capsule), saltpetre and nitric acid in the proportion of one fluidounce of acid to every five pounds of the salt. Every trace of hydrochloric acid will in this way have been removed, and the distillate from the saltpetre so treated will be pure nitric acid. (The editor remarks that this method has been recommended, among others, by J. Bischoff in his "prakt. Arbeit. im chem. Labor.," 1862).—*Archiv for Pharm.*, 1876, p. 151.

Extract of Beef.—Bouchardat warns against the incautious use of this extract, under the mistaken notion that an increase of dose will be followed by a corresponding increase of benefit. Both he and Stuart Cooper have shown that large doses of the extract are quite injurious. He further asserts that it cannot at all be compared to meat-juice (expressed in the cold from raw meat) as a strength giver.—*Ibid.*, p. 160, from *Bull. Thérap.*, 1875, Nov.

Phosphorus.—The solution of phosphorus in alcohol generally takes from 12 to 24 hours, and the alcohol has moreover to be kept warm all the time. It is, therefore, proposed to use glycerin as a solvent. Phosphorus dissolves quite readily by shaking for several minutes with warm glycerin; an addition of warm alcohol will prevent any deposit of phosphorus in cooling.—*Ibid.*, p. 162, from *Apoth. Zeit.*, 1875, No. 35.

Assay of Cinchona.—Handry recommends the following as a very quick and sufficiently reliable method: Put into a beaker-glass (or other convenient utensil) 10 grams bark in coarse powder, and 20 grams ammonia water; stir for several minutes, and add 15ccm. ether, stir again, let stand till clear and decant the ether into a bottle. The warmth of the hand will be sufficient to evaporate the ether remaining in the mixture. Now repeat the treatment with ether 5 to 6 times, taking care not to add the ether before the remainder of the former has entirely evaporated. The difference in the weight of the beaker, before and after the ether treatment, indicates the amount of quinia.

Cinchonia is estimated by treating this residual bark with chloroform in the same way as above.—*Ibid.*, p. 163, from *J. de Pharm. et de Chim.*, 1876, p. 208.

Antidote to Strychnia.—The East Indian physicians recommend nicotia as the surest antidote, which is given in exceedingly small quantities in sherry several times a day. In default of nicotia, a decoction of tobacco leaves ($\frac{1}{2}$ ounce to a pint) is given.—*Ibid.*, p. 167.

Adulteration of Arrow Root.—H. P. Madsen, received some time ago, an original package of arrow root, the appearance of which was all that could be desired, and stood the test of the Danish Pharmacopœia, particularly that with muriatic acid, very well. It did dissolve completely in boiling water, but did not form a thick mucilage even when a very large quantity was dissolved. Examined under the microscope, the arrow root in question presented elliptical grains, about three times larger than those of maranta, and mostly provided with a well-developed hilum, which latter characteristic points to *tacca fecula* from *tacca pennatifida*. The grains of *canna fecula* (from *canna coccinea*) are of similar shape and size, but the hilum is quite indistinct. The package was consequently returned.

He mentions also having received two packages with damaged arrow root. About the first cask there could not be any doubt, the

musty smell pervaded the whole contents; the second cask, however, presented nothing unusual in the top layer, but the last half of it was found to be musty. Mr. Madsen, therefore, recommends to examine the whole package, and not to be satisfied with a small sample from the top.—*Nij Pharm. Tid.*, 1876, p. 140.

Pharmacy in Sweden.—The new poison law dates from January 7th, 1876. The following abstract will give a fair idea of its strict requirements :

Arsenious acid must not be manufactured except by special permission, and cannot be imported by other persons than apothecaries and those manufacturers for whom arsenic is a necessity. It can be retailed only by apothecaries, and then only on a *recent* prescription (or order) from a physician, veterinary surgeon or dentist. It may be sold, further, to well-known savants and to other people licensed to its use. It must not, on any account, be sold for poisoning animals, or for conservation of corpses.

The *sworn* assistants (every graduate in Sweden is sworn to his profession, so to speak, before being permitted to serve as such) can only sell arsenic on a prescription ; the other sales can only be made by the apothecary himself.

The responsibility is put somewhat curiously : The pharmaceutical assistant and the superintendent of a factory are responsible for any and every transgression ; while the apothecary and manufacturer only are responsible in so far as they themselves are parties to it.—*Ibid.*, p. 173.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Solution of Albuminate of Mercury for Hypodermic Injection.—Prof. Bamberger dilutes the albumen of hens eggs with 4 times its volume of water, strains through cloth and passes the liquid through a plaited filter. Should the filtrate not be perfectly clear, it is mixed with a few drops of glycerin, well shaken, and after 10 or 12 hours filtered. It is important that an excess of albumen as well as of corrosive sublimate be avoided. To attain this, Dr. Hamberger uses carbonate of sodium as an indicator. To a small portion of the albumen solution, a solution of corrosive sublimate of known strength is gradually added, and a drop of the liquid occasionally tested with the soda solution ; the

appearance of a yellowish or reddish color indicates an excess of corrosive sublimate. Sufficient of the albumen solution is now added until the precipitate by carbonate of sodium has a purely white color. The amount of chloride of sodium necessary for affecting a permanent solution is now ascertained by adding sufficient of its aqueous solution until merely a faint cloudiness remains. From the figures thus obtained the necessary proportions are readily calculated. The mixture is set aside for two days, then filtered and kept in small well-corked vials in a cool place. The solution is made to contain 1 per cent. of mercury albuminate, when 20cc. will yield 0.171 sulphide of mercury.—*Zeitschr. d. oester. Apoth. Ver.*, 1876, No. 10 and 12.

Solution of Ammonium Acetate.—J. C. Thresh purchased seven samples, only two of which were colorless and had a neutral reaction. They varied in specific gravity between 1.011 and 1.018 and the percentage of ammonium acetate between 4.6 and 7.9.—*Pharm. Jour. and Trans.*, 1876, April 1, p. 781.

Glycerol of Subacetate of Lead is recommended by Balmanno Squire as a very useful application in chronic eczema and other skin diseases. It is prepared of the same strength as the liquor plumbi subacetatis, substituting glycerin for the water. The heating is effected in an oil bath, care being taken to keep the temperature a little below the boiling point of glycerin, and when the reaction has been accomplished, the solution is to be filtered while hot, since after cooling it is too viscid to pass through the filter. For use it is diluted with from three to seven times its quantity of glycerin, as occasion requires.—*Phar. Jour. and Trans.*, May 6, p. 881.

C. D. Parry proposes to mix equal measures of liquor plumbi subacetatis and glycerin and to evaporate by gentle heat until the water is driven off.—*Ibid.*, May 27, p. 942.

Phosphorus Pills.—Messrs. Allen and Hanburys suggest the following formula as an efficient substitute for that of the British "Pharmacopœia," which combines the phosphorus with tolu balsam and yellow wax: 2 grains of phosphorus dissolved in sufficient bisulphide of carbon, are mixed with powdered soap and guaiac resin, of each gr. xxxv, glycerin gtt. xii and powdered liquorice root gr. xii or sufficient to make a mass weighing gr. c. The bisulphide evaporates readily, and the mass formed is of good consistence, easily manipulated, readily misci-

ble with other remedies, and what is most important readily soluble.—*Ibid.*, May 20, p. 921.

Pancreatic Meat Emulsion has been brought to the notice of the Berlin Apothecaries' Society, by F. Riedel, who obtained from Dr. Rosenthal the following formula for its preparation: 250 grams of finely scraped beef are triturated in a mortar with 25 grams of pancreatic liquid (from the hog) and warm water, until a homogenous, light reddish brown emulsion-like mixture results, which is injected per anum with some pressure, the bowels having been previously cleansed by warm water injection. It is stated that persons have thus been nourished, who for months were unable to swallow or digest food taken in the ordinary way.—*Phar. Zeit.*, No. 18.

The Preservation of Raw Meat is effected by A. Herzen by immersing it for 24 or 36 hours in a solution containing 150 boric acid, 30 borax, 15 table salt and 5 saltpetre in 2,000 parts of water. The meat retains its fresh appearance and may afterwards be packed in barrels.—*Chem. Centralbl.*, 1876, No. 15.

Black Varnish for Leather.—Hager gives the composition of a commercial article as follows: 30 parts shellac, 2 p. mastic, 1 p. sandarac, 1 p. Venice turpentine, 1 p. castor oil, 145 p. 95 per cent. alcohol and sufficient nigrosin (anilin black).—*Apotheker-Zeit.*, 1876, No. 9.

Nickelplating.—W. Baker and J. Unvin use the following composition of the solution: 100 p. nickel sulphate, 53 tartaric acid, 14 caustic soda and 100 parts of water.—*Ber. d. deutsch. chem. Ges.*, 1876, 109.

The bark of Rhamnus frangula, which has recently been frequently recommended as a reliable cathartic, has been the subject of a curious observation by Dr. Lamm, of Stockholm. Finding that a bark required double or even treble the usual dose, he ascertained that it had been recently collected, and in comparing it with a bark known to be three or four years old, obtained much better and prompter results with the latter. The inefficacy of the fresh bark may account for the disuse into which *Rhamnus frangula* has occasionally fallen. Fristedt mentions (1873) that the recent bark produces colic and vomiting, and the last edition of the Norwegian "Pharmacopœia" requires the bark to kept for one year before it is used medicinally.—*Zeits. Oesterr. Apoth. Ver.*, 1876, p. 156.

Hops as a Ferment.—It is usually assumed that the addition of hops in beer-brewing has the effect of retarding fermentation, in consequence of the precipitation of albuminous substances by its tannin and volatile oil. Sacc, however, believes that hops support fermentation, and that they contain a peculiar ferment of greater fermentative power than beer yeast; this ferment he assumes to be soluble in water, and to be not destroyed by boiling. As a proof of this, he cites the manner in which hops are employed in the United States for the preparation of yeast and in bread-baking.—*Phar. Cent. Halle*, 1876, No. 11.

Composition of Malt.—W. G. Valentin reports the following composition of two samples of pale malt:

Starch,	44.15	45.13
Other carbohydrates (60—70 per cent. consist of fermentable sugars), inulin (?Kühnemann's sinistrin), some other bodies soluble in cold water,	21.23	19.39
Cellular matter,	11.57	10.09
Fat,	1.65	1.96
Albuminoids: a, sol. in alcohol, sp. gr. .820, and in cold water,	.63	.46
b, sol. in cold water, and at 68° C.	3.23	3.12
c, insol. in cold, but sol. in water at 68° C.,	2.37	1.36
d, insol. at 68—70° C., but sol. in cold water (albumin proper),	.48	.37
e, insol. in cold water, and at 70° C.	6.38	8.49
	13.09	13.89
Ash,	2.60	1.92
Water,	5.83	7.47
	100.12	99.76

—*Pharm. Jour. and Trans.*, 1876, April 15, p. 826.

Volumetric estimation of Carbolic Acid.—Landolt has proposed (*Ber. d. deut. Chem. Ges.*, iv, p. 770) to estimate this acid by precipitating its aqueous solution with bromine water, and weighing the washed and dried tribromophenol which is produced according to the equation: $C_6H_5.OH + 6Br. = C_6H_2Br_3.OH + 3HBr$. Owing to the volatility of the tribromophenol, W. F. Koppeschaar suggests to make a volumetric determination by adding a known volume of titrated bromine water, which is more than sufficient to change all the phenol present into tribromophenol, and then titrate the excess of bromine in the usual manner by

adding potassium iodide and estimating the iodine by sodic hyposulphite, with starch as the indicator. It is necessary to avoid the loss of bromine by evaporation. Practical results have also been obtained by using, instead of bromine, a mixture of $5\text{NaBr} + \text{NaBrO}_3$, made by acting with bromine in excess upon caustic soda, evaporating to dryness and mixing well by trituration; if pure, 751 grams of this mixture are required for .1 gram of phenol. In using this mixture, hydrochloric acid is added to liberate the bromine, otherwise, the manipulation is essentially the same as before. A mixture of the corresponding potassium salts appears to be less serviceable.—*Phar. Jour. and Trans.*, April 15, p. 821-824.

NOTES ON THE INTERNATIONAL EXPOSITION.

BY THE EDITOR.

II.

At the Paris exposition of 1867, the exhibits of each nation were arranged in spaces radiating from a central building, which was surrounded by several encircling avenues of an oval outline, these avenues separating the various groups of raw and manufactured materials from each other. It was thus possible, by passing along these concentric avenues, to examine all the goods of the same class that were exhibited by the different nations represented, thus affording great facilities for reviewing and comparing the natural resources and industries in any special class, of all the countries exhibiting. This plan, admirable in theory, proved, however, a failure, in so far as many nations could not fill the space allotted for the different groups, either for the entire want or comparative non-importance of the special industries, so that the otherwise unavoidable blanks had to be filled with goods from other groups. Notwithstanding this drawback, the arrangement offered obvious advantages, which, viewed from another standpoint, are counterbalanced by the arrangement of the present exposition, whereby the most important industries can be displayed to the best advantage, and a bird's-eye view obtained of the total productions of each country.

While it must be acknowledged that the general plan of classification, as adopted by the Centennial Commission of the United States, has, in the main, been adhered to also in the arrangement of the special displays, still there are discrepancies, which render the systematic study of any particular branch of industry a matter involving considerable labor, often increased by the long journeys from one building to another distant one, the intercourse, however, being facilitated by a narrow-gauge railroad, with frequently running trains, which convey the visitor to within the immediate neighborhood of all the important buildings. To illustrate the difficulty hinted at, we may briefly mention that the Main Building contains the greater portion of the fixed and essential oils, while very important displays of the same class of goods are also found in the Agricultural Building, where, likewise, liquor-

ice root and liquorice from Italy, a number of indigenous drugs, etc., are observed. These variations in the arrangement are partly due to the prominence assumed by such articles as products of the soil of some of the countries, partly to the fact that many exhibitors have brought forward and displayed in their cases goods belonging to several groups; and, to a considerable extent, they are due to the desire of displaying most effectively the products of one country as an unbroken whole. The latter is particularly noticeable in the exhibits of several British colonies, Egypt, and some other countries, where articles of food form an important portion of the display in their respective departments in the Main Building.

It is not our purpose in these "Notes" to give a list of the exhibitors or enumerate all the objects of interest to the pharmacist and druggist, nor is it the intention of going much into detail, or of attempting to minutely discuss the merits of all. The latter is possible only for the members of the juries of the different classes, who are afforded ample opportunities for closely inspecting, and, if necessary, testing everything which has been entered for competition. Visitors are not permitted to handle the specimens; but we are under obligations to many private exhibitors as well as foreign commissioners for courtesies extended to us. The main object of these "Notes" will be to convey to the readers of the "Journal" a general idea of the main character of the Exhibition, as far as it relates to articles more directly relating to the drug and apothecary business.

In a country like the United States, where proprietary medicines are largely consumed by the public, the almost total absence of these preparations is quite noteworthy. Since the admission of nostrums to the Exposition was wisely prohibited by the Commission, it seems strange that an extensively sold cherry pectoral and other preparations by the same manufacturer should have been permitted to occupy a space here. If we except one or two minor nostrums, and perhaps also the largely represented class of proprietary elixirs, which, in character, are about intermediate between legitimate pharmaceutical preparations and nostrums, we find nothing in the American department to mar the pleasing effect of the exhibits in this line; even the numerous hair dyes and invigorators are noticeable from their almost complete absence. From some of the foreign countries, however, quite a number of such specialties have been sent, yet mostly in such small numbers, and often so unsightly in external appearance, as to attract little notice. To this there are, however, some exceptions, and, to judge from the display of a foreign cherry cordial, it may be presumed that this nostrum is of some importance in its native country, and there, probably, takes the place of the numerous bitters and tonics which, in this country, furnish the necessary alcohol, in the scarcely disguised garb of medicine, to those who do not consume alcoholic liquids as beverages.

What naturally attracts the prominent attention of the pharmacist and druggist, is the display of drugs, in which, however, some countries are insufficiently represented; others compensate for this shortcoming by exhibiting the medicinal resources to advantage, and in a manner inviting to closer study. We have noticed but few exhibits—one in the U. S. Department, and one or two in the enclosure of foreign countries, which show commercial drugs from foreign countries without any additional preparation or purification. Alexandria senna, West Indian canella alba and similar articles, in our opinion, show neither the resources nor the industry

of the United States, unless the former were exhibited, for instance, in connection with the fluid extract, or the latter with the volatile oil or oleo-resin prepared from it in this country, the crude being then valuable only as the source of the manufactured article.

The display of drugs indigenous to the United States, is not as extensive as might have been expected; still there are some very creditable collections, and more may perhaps be found in the Agricultural building, where we observed a specimen of the bark of *Celastrus scandens*, marked *Solanum dulcamara*, the parties having been undoubtedly misled by the name of *bittersweet*, which is commonly used to designate both drugs. But we shall speak more fully of our indigenous *materia medica* on a future occasion, and now proceed to the crude drugs of foreign countries and their various products.

The gem of the exhibit of drugs, in our opinion, is found in the enclosure of the Dutch colonies, where the cultivation of the cinchonas is shown in an admirable manner. The introduction of the cinchonas into Java, and subsequently into India and other countries, is now a matter of history which has recorded also the names of those who were active in introducing the plants and observing the most favorable conditions under which the various species are most successfully cultivated. It is well known that the first attempt on a large scale was made in Java in 1856 by Hasskarl, while Pahud was colonial minister in the Netherlands. But it was chiefly after the cultivation was commenced in British India in 1860, and the results of the observations made in the two countries were compared, that the plantations assumed not only large dimensions, but that also the yield and quality of the bark gave promise of undoubted success.

Examining these colonial products, we notice first nine photographs, comprising views of different cinchona plantations in Java, and of a propagating house, where the young plants are nursed until they are fit for being transplanted to the plantation. Another photograph shows a number of workmen engaged in stripping the bark, and the last one the manner in which it is dried and packed. We now turn our attention to the botanical specimens, of which there are eleven distinct varieties, of each a flowering branch and one with developed capsules being fastened upon card board, together with three specimens of bark taken respectively from the branchlets, the larger branches and the trunk. In addition thereto, each variety is accompanied by a card, upon which is fastened a transverse and a longitudinal section of the stem, so that upon the two cards all the characteristics, morphological as well as structural, can be readily studied. There is also of each variety, a log about two feet in length, covered with the bark, and one end cut so as to show a longitudinal and a transverse section of both the wood and bark. Samples of bark of each variety, several being in bales, complete this interesting collection, which is so handsome and complete in itself as to challenge the admiration of all interested in this industry.

The collection embraces eight distinct species of *Cinchona*, one or two of which are not rich in alkaloids, namely: *C. micrantha*, Ruiz and Pavon, *C. Hasskarliana*, Miquel, *C. lancifolia* var. *discolor* Karsten, *C. officinalis* Lin., *C. caloptera* Miq., *C. succirubra* Pavon, *C. calisaya* Wed. and *C. Pahudiana* Howard. Of the latter species, there is also the variety *lanceolata* Miq., and *calisaya* is represented by no

less than three varieties, namely: 1, raised from seed brought by Hasskarl; 2, from seed sent by Schuhkraft, and 3, by Ledger from Bolivia. The branches of the first variety have broadly ovate leaves with a tapering base; those of the second are much narrower and lanceolate, and of the third variety, ovate and lanceolate leaves are presented.

The Javanese exhibition of cinchonas would be incomplete without the display of the cinchona alkaloids, which together with some of their salts, are shown in various stages of purity; likewise the mixed alkaloids of red bark which have been used with good results in the Indian hospitals and Europe (see *Quinetum* in March number, p. 134). These preparations are manufactured in Java, and although they are not of the dazzling whiteness in which we expect to see them here, no doubt can be entertained of their purity, a minute quantity of coloring matter excepted.

Adjoining the Netherlands, we find in the enclosure of Mexico an instructive collection of medicinal plants, sent here by the Sociedad Mexicana de Historia Natural. For the present, we notice more especially a dried specimen of *Cinchona Calisaya*, including flowers, fruit and bark. *Cinchona* seeds were distributed in Mexico in 1866 by the Emperor Maximilian, but for several years afterwards the cultivation was not successful (see "Amer. Jour. Phar.," 1870, p. 542). This seems to be different now, if we may be permitted to judge from botanical specimens of the plants and samples of their barks exhibited by Mr. Hugo Fink, of Cordoba, and which were grown by him in the neighborhood of that city. Three species are represented, namely, *Cinchona officinalis*, *Lin.* (*S. condaminea*), *C. succirubra* and *C. calisaya*. Two botanical specimens (flowering and fruiting branch) are shown of each species, and though in beauty of preparation and preservation they are not equal to the Java specimens, yet, in the absence of the latter, they would be regarded not only as interesting and instructive, but even as beautiful. Specimens of quilled bark accompany each species, and of *Cinchona officinalis* a section of the trunk, 9 years old, nearly 2 feet long and about 6 inches in diameter is shown, with the bark still adhering.

Passing westward in the Main Building, we meet cinchona barks again in the American department in connection with the displays of Powers & Weightman and of Rosengarten & Sons, where they are shown as the source of quinia and the allied alkaloids exhibited by both firms in large quantities and in a variety of combinations. The barks exhibited by Rosengarten & Sons comprise samples of red, *Calisaya*, hard *Pitaya* and cinchona barks, grown in India and Ceylon. Powers & Weightman show original packages and separate samples of *Calisaya*, red and other South American barks, and samples of their powder; also, East Indian bark from *Cinch. succirubra* and *C. officinalis*, the latter partly of the first crop and partly of the renewed kind. It will be remembered that in India the bark is partly removed from one side of the tree in such a manner as not to disturb the cambium layer, after which the wound is covered up, when the bark will again be formed, and, after some years, will have attained sufficient thickness to be collected as renewed bark. Treated in this manner, the tree is made to yield several successive crops of bark.

The cinchona alkaloids and their salts form a prominent feature of the exhibits of the two Philadelphia firms mentioned, more particularly the sulphates which are shown in bulk in large quantities; the weight of the quinia sulphate in one glass

case of Powers & Weightman's being 1,003 ounces. Chinoidin is likewise to be found in both places in very considerable quantities.

Among the new or rarer salts exhibited by both firms, may be mentioned the handsomely-crystallized bisulphates of the four cinchona alkaloids, which are more soluble than the sulphates ordinarily employed—the hydrobromates, hydriodates, hydrochlorates, phosphates, acetates, citrates, etc., of one or more cinchona alkaloids. Similar salts of the same alkaloids are likewise shown by Ch. T. White & Co., and amongst them is particularly noticeable a very handsomely-crystallized sample of valerianate of quinia. In this connection it may not be amiss to again call attention to the incorrectness of naming the compounds of alkaloids with hydrobromic acid *bromides*; since in these combinations the hydrogen of HBr is *not* displaced, their correct appellation is *hydrobromates*.

Directly opposite to the chemical exhibits of the United States is the chemical section of the German empire, in which we find compounds of the cinchona alkaloids, exhibited only by Jul. Jobst, of Stuttgart, the other quinia manufacturers being not represented. Besides several of the salts mentioned above, we find here crystalline masses of a compound marked Chininum sulfuricum biacidum (tetrasulphuricum), and which, therefore, appears to be a definite compound of one molecule of quinia and four of sulphuric acid. The results of Jobst and Hesse's observation, mentioned in another place (see page 328), are shown in small samples of phenated muriate and sulphate of quinia, named by them phenylmuriate and phenylsulphate, names which, at least for pharmaceutical purposes, appear to us to be less desirable than the former, because one may be confounded with the sulphophenate (sulphocarbolate) from which it is entirely distinct. Since the new salts liberate carbolic acid very readily under various circumstances, they may probably be destined to become important remedies. Salicylate of quinia, the only specimen noticed by us, is exhibited by the same firm; also, the handsomely-crystallized compound of quinia with anethol, discovered some years ago by O. Hesse. It has the taste of quinia and anise, and when heated evolves anethol. The conchinin (Hesse's) and its preparations exhibited, are identical with Pasteur's quinidia; but the chinamin is an alkaloid, discovered by O. Hesse in the bark of Cinch. succirubra, cultivated in British India, and the name of which we rendered with *quinamina* ("Amer. Jour. Phar.," 1872, p. 302), when noticing Hesse's original paper. The phenylsulphate of cinchonidia, we suppose, belongs to the same class of compounds noticed above, but we do not remember having met with an account of it.

It will be observed that in this exhibit—notwithstanding the large case and the small bottles by which attention is first attracted to it—we meet the results of very considerable original research.

Some distance to the northwest of the former, and just at the entrance to the exhibits of Jamaica, we observe a stem, 22 feet high, of Cinchona succirubra. We are informed by Mr. Robt. Thomson, Superintendent of the Government Botanical Gardens, at Kingston, Jamaica, and commissioner to this exposition, by whom the very interesting and instructive collection from Jamaica has been very judiciously arranged, and to a considerable extent furnished, that the cultivation of cinchonas was commenced there by the government in 1868, the plantation now consisting of 300 acres, about 40 acres having been planted annually. The

climatal conditions requisite for this culture are found in the Blue mountains, at a height of from 4,000 to 6,000 feet above the sea, where the temperature rarely falls below 50° F. or rises above 70°, and where the necessary humidity is afforded. The first crop of bark is expected to be realized about the tenth year from the time of planting out, as has been the case in the plantations of India. Mr. Thomson exhibits, however, the bark from three trees, seven years old, of which *C. Calisaya* yielded 3, *C. succirubra* 4 and *C. officinalis* 2 lbs. of bark. According to the analyses, made by De Vrij and Howard, some time ago, the last named species does not promise to become rich in alkaloids. Moreover, it does not grow so vigorously as the two preceding species, and, as will be seen above, yields less bark in the same period; for these reasons its cultivation has not been extended for some years past. The two other species, of which the *succirubra* is the most rapid grower, yielded, to the two quinologists named before, very satisfactory results, so that Jamaica may be expected to produce, in a few years, a steady supply of excellent cinchona bark.

With the above, we have exhausted all the fine specimens of cinchonas and their products. The India department of the exhibition contains, from the India Museum, at London, an excellent collection of articles of *Materia Medica* from the East Indies, which gives a fair idea of the vast resources of that rich country. In that collection are also samples of *Calisaya* and red barks from the Neilgherry mountains and Kangra, but the specimens are small and insignificant as compared with those enumerated above, nor has an attempt been made to show the extent and success of the cultivation of cinchonas, as we find it in the departments of Netherlands, Mexico and Jamaica; the chemical section of the United States gives a far better insight into the importance of India in this respect. The other British colonies, into which the cinchonas have been introduced, make, like India, no especial display of these valuable barks, nor has Peru sent any samples of these products of her soil, except a small bottle labeled *cascarilla*, without any other designation, and containing quilled cinchona bark of undetermined origin.

Brazil exhibits a bark, from Matto Grosso, which is labeled *Ginchona cuyabensis*, a name which we do not find in Weddell's "Notes sur les Quinquinas," nor is it stated whether this bark really contains any cinchona alkaloid.

The chemical products of the cinchonas are likewise not as well represented as they deserve to be for their industrial importance alone, even firms being absent whose quinia is sometimes met with on this side of the Atlantic. It is true that small samples of quinia and other alkaloidal salts are to be found scattered in various places of the exposition; but they have the appearance rather of being sent here as products of pharmaceutical skill, than to give an idea of the large industrial pursuits of their countries.

In the above account we have taken no notice of the scale preparations of quinia and iron, of which there are numerous samples, large and small, on exhibition, not only by manufacturers of quinia, but also by other manufacturing chemists, manufacturing pharmacists and manufacturers of specialties. The scales are either red-brown, like the salt officinal in the U. S., or green, like that officinal in the "British Pharmacopœia." All are handsome in appearance.

We have observed only one living specimen of *Cinchona* in the Horticultural Hall of the exposition; it is *C. succirubra*, and the little tree is about four feet high.

VARIETIES.

NEW CRYSTALLISED HYDRATE OF HYDROCHLORIC ACID. By I. Pierre and E. Puchot.—Strong commercial hydrochloric acid may be maintained at a very low temperature without any change; but when into the cooled liquid a continuous current of nearly dry hydrochloric acid gas is passed, an abundant deposition of crystals soon occurs, and at the same time the temperature rises from -22° to -18° , remaining stationary at this last point during the formation of the crystals. These crystals decompose rapidly in the air, emitting white fumes; they very quickly dissolve in water at ordinary temperatures, but at -18° the solution is effected very slowly. Analytical results lead the authors to assign for their composition the formula $\text{HCl} \cdot 2\text{H}_2\text{O}$.

They find that mixtures of snow and ordinary hydrochloric acid constitute powerful and economical refrigerants. With 2 parts of snow to 1 part of acid a lowering of the temperature to -32° is readily obtained.—*Journ. Chem. Soc.*

INFLUENCE OF VARIOUS SOLUTIONS UPON THE RUSTING OF IRON. By A. Wagner.—Details are given of experiments made upon strips of iron which were acted upon by water containing various salts, in presence of air free from carbon dioxide, and of air containing that gas at various temperatures, and also in sealed tubes, from which air was expelled.

The general results were that pure water in presence of air, causes iron to rust; that if carbon dioxide is also present, the rusting is more rapid; that the production of rust is materially increased by the chlorides of magnesium, ammonium sodium, potassium, barium and calcium, the first mentioned being most active in this respect; that iron immersed in evaporated river-water rusts more slowly than iron in distilled water; that the presence of oils or fats greatly diminishes the rapidity of rusting; that alkalis prevent the rusting entirely. Magnesium chloride solution in the absence of air attacked iron at a temperature of about 100° ; chlorides of sodium, potassium, barium, and calcium were without action under the same circumstances. The original paper must be consulted for details and measurements. *Journ. Chem. Soc.* [Lond.]

ON THE ACTIVE CONSTITUENT OF ERGOT OF RYE. By R. Buchheim.—According to the author's experiments, the active constituent of ergot (ergotin) is a body closely resembling animal gelatin. It is easily soluble in cold water, and is, therefore, contained in the cold aqueous infusion of ergot. Like gelatin, it gives precipitates with phenylsulphuric acid, tannic acid, and chlorine. It cannot, however, be completely precipitated by tannic acid. It is formed by the action of the mycelium of a fungus on the gluten of rye, by which action the gluten undergoes a series of transformations, terminating in its conversion into leucin, ammonia, and trimethylamin. The decomposition of gluten under the influence of the fungus is, therefore, analogous to the putrefaction of albumin. In both cases albuminous substances undergo a series of transformations different from that which occurs in the healthy animal organism, and the products formed have, in

consequence, different properties. The end-products, however, are the same in both series. Ergotin, therefore, belongs to the class of putric products, and the author thinks it may be possible to obtain from other sources, as for instance putrid blood, a body having similar properties.—*Jour. Chem. Soc. [Lond.]*, from *Arch. Pharm.* [3], vii, 32—39.

COMBINATION OF PHENOL WITH NEUTRAL QUINIA SALTS.—J. Jobst and O. Hesse obtained white shining prisms on adding an equivalent weight of carbolic acid to a hot aqueous solution of neutral quinia sulphate, or on dissolving the salt in a hot alcoholic solution of carbolic acid (see also "*Amer. Jour. Pharm.*," 1876, p. 216). The salt is readily soluble in boiling water and alcohol, but requires at 15° C., 680 parts of water and 74 p. of 80 per cent. alcohol for solution. Ether and chloroform dissolve only traces of it, but it is freely soluble in a mixture of 2 vols. chloroform to one of 97 per cent. alcohol. At 100° C. it loses only water of crystallization; at 130° C. (266° F.) some carbolic acid is given off. Analysis proved its composition to be $2(C_{20}H_{24}N_2O_2, SO_3).C_6H_5O + 2H_2O$, which formula requires 9.32 SO_3 , 4.17 H_2O and 75.52 quinia. Salts of similar composition were obtained with hydrobromate and hydrochlorate of quinia.—*Ann. d. Chem.*, clxxx, 248.

QUACK-NOSTRUMS.—A. Thurmayer, druggist, at Stuttgart, vends a remedy for enuresis nocturna, consisting of two vials, one of which, intended as an embrocation for the regio pubis, is merely expressed oil of almonds. In the other vial, containing the internal remedy, a liquid is furnished, consisting of about six drachms of urine, mixed with an equal quantity of diluted spirit.—*Apoth. Zeit.*, No. 9, from *Industrie Bl.*

Julius Bittner has introduced Schneeberg's consumption herbs, an infallible(?) cure for consumption, which are composed of Iceland moss 100 parts, althea and liquorice roots, each 20 parts; figs, St. John's bread, pearl barley, Corinthian raisins, althea leaves and flowers, mallow flowers, mullein flowers, ground ivy, liverwort, colt's foot leaves, lungwort (*Pulmonaria*) and red poppy petals, of each 5 parts.—*Ibid.*, No. 12.

Lebert's American vegetable hair restorative is, according to J. I. E. Popp, a mixture of 2 grams milk of sulphur, 4½ grams sugar of lead, 25 grams glycerin and 140 grams perfumed water.—*Pharm. Zeit.*, No. 14.

LAROCHE'S FERRUGINOUS CINCHONA WINE has been examined by Wittstein, and found to contain neither quinia, cinchonina or iron; it is merely an alcoholic tincture of orange berries, sweetened with sugar.—*Arch. d. Pharm.*, 1876, April, p. 339.

ANISE EARTH is the name given to a gray clay which occurs in the neighborhood of Wischau and Rausnitz, in Moravia, and is formed into small roundish granules by the action of earthworms. In the same neighborhood anise is extensively cultivated, and this granular clay is used by the dealers to adulterate the anise fruit to the extent of 20 per cent. The collectors of this *anise earth* receive about one

guilder (nearly 50 cents) for the hundred weight; the earth is also exported to a considerable extent for the same purpose. By dropping a pinch of the suspected anise upon white paper, from the height of about twelve inches, the adulteration is readily detected, and its amount may be approximately ascertained by picking out the fruit.—*Apoth. Zeitung*, No. 20.

VANILLIN FROM EUGENOL.—E. Erlenmeyer announces that on treating eugenol-potassium with potassium permanganate (and it seems as if the same result was obtained with potassa alone), vanillin may be obtained. During the action a crystallizable polymer of eugenol is formed. After the completion of his researches, the author will report the results in detail.—*Ber. d. Chem. Ges.*, 1876, 273.

EUCALYPTUS GLOBULUS.—P. A. Hartzer has obtained the following principles, from old leaves: an acid resin yielding, with sulphuric acid, a copulated acid of a handsome carmine color, becoming violet on the addition of ether; two resins, which are not colored red by sulphuric acid; a new fatty acid, crystallizing in fine needles, the sodium and potassium salts of which are soluble in ether; cerylic or a similar alcohol and tannin. The latter yields a red deliquescent crystalline salt on treating the ethereal solution of the alcoholic extract with a solution of potassa in absolute alcohol.—*Ibid.*, 314–316.

PITTAKAL, which was discovered by Reichenbach, 40 years ago, but has not been observed since, has been recently obtained by Grätzel, from the fractions of wood tar having a high boiling point. Liebermann separated from it orange-colored needles, which he names *eupitton*. They dissolve in alcohol and acetic acid with a brown, in ammonia with a blue and in alkalis with a purple color; carbonic acid, or the addition of saline solutions causes blue precipitates which are soluble in pure water, the precipitates by calcium, magnesium, barium and tinsalts usually having a beautiful gold lustre. The lead precipitate dissolves in concentrated sulphuric acid with a red color, which changes to blue on warming.—*Ibid.*, 334–337.

NAPHTHALIN FROM OIL OF TURPENTINE.—By passing oil of turpentine through a red-hot tube, G. Schultz observed that much carbon was separated, and hydrogen evolved, the distillate containing several hydro-carbons. On redistilling the product, the portion obtained between 230 and 232° C. congealed, and, after filtering and pressing, between bibulous paper, yielded naphthalin, which crystallized from alcohol, fused at 30° C. (176° F.), boiled at 217° C. (422.6° F.) and furnished with picric acid, a compound crystallizing in yellow needles and fusing at 149° C. (300.2° F.).—*Ber. d. Deutsch. Chem. Ges.*, 1876, p. 548.

A NEW GLUCOSIDE IN THE FLOWERS OF CICHORIUM INTYBUS has been discovered by Dr. R. Nietzki. The flowers were extrated with boiling 60 per cent. alcohol the alcohol evaporated in the presence of water, the filtrate slightly acidulated with acetic acid, and precipitated by acetate of lead. The clear filtrate was treated with sulphuretted hydrogen, and then evaporated to a thin syrup, from which the body crys-

tallized on standing; it was washed with cold water and repeatedly crystallized from hot water, when it formed white stellate needles, which were insoluble in ether, freely soluble in hot water and alcohol, also with a golden yellow color in caustic and carbonated alkalies. The warm solution had a very bitter taste. Boiled with a dilute acid, sugar is produced, and a sparingly soluble crystalline body.—*Arch. d. Pharm.*, April 327-337.

SALICYLATE OF SODIUM, when treated in aqueous solution with carbonic acid, is decomposed, yielding free salicylic acid. Since carbonic acid is continually formed by the various tissues, the blood, notwithstanding its alkalinity, contains a certain quantity of carbonic acid in the free or continually dissociating condition, and for these reasons, Prof. Binz believes that salicylates are not without action when taken internally. This view is strengthened by the antiseptic action, observed in liquids capable of putrefaction, urine for instance, when mixed with salicylate of sodium and carbonic acid.—*N. Repert.*, 1876, 205-210.

MINUTES OF THE COLLEGE.

PHILADELPHIA, June 26th, 1876.

A stated meeting of the Philadelphia College of Pharmacy was held this day at the College Hall, No. 145 North Tenth Street.

In the absence of the President, Professor John M. Maisch was called to the chair. Sixteen members present.

The minutes of the annual meeting were read, amended, and adopted.

The minutes of the Board of Trustees for the last three months were read by the Secretary of the Board, and on motion approved.

Wm. C. Bakes read a letter from Professor de Luca, of Naples, donating to the College, with an order for the goods, some specimens of Chemicals, which are now on exhibition at the International Exposition.

Also a letter from Mr. Bosisto, President of the Pharmaceutical Association of Victoria, Australia, donating several specimens of drugs, including a number of products from the various species of Eucalyptus, also on exhibition at the Centennial.

On motion, the Corresponding Secretary was directed to acknowledge the receipt of the letters, and to convey to both the gentlemen the thanks of the College for their respective valuable donations to the Cabinet.

Professor Maisch stated that on the 11th of July he would attend the International Exposition at the request of some members of the Botanical Class, to explain to them such drugs, chemicals and Botanical specimens as were there exhibited. He embraced this opportunity to extend an invitation to all students feeling an interest in the matter to be present at the time appointed.

This being the time for an election for delegates to attend the meeting of the American Pharmaceutical Association in September next, and also for delegates to

attend the Conference of Pharmaceutical Colleges, an election was ordered. Edward C. Jones and E. M. Boring acting as tellers, reported the following gentlemen elected as delegates to the American Pharmaceutical Association, viz. :

Charles Bullock, Peter Williamson, Thos. S. Wiegand, Samuel F. Troth, Wm. J. Jenks.

Delegates to the Pharmaceutical Conference: Professors Robert Bridges, John M. Maisch, Joseph P. Remington. Then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

MINUTES OF THE PHARMACEUTICAL MEETING.

A meeting for social and scientific purposes in continuance of the regular pharmaceutical meetings was held June 20th, 1876, James T. Shinn in the chair. The minutes of the previous meeting were read and approved. Strangers present were invited to participate.

Prof. Maisch donated to the library "*Ricerche sperimentali sulla Solfatara di Pozzuoli, per S. Luca*" and ten other pamphlets by the same author, which were sent by him with the specimens donated to the cabinet.

From J. U. Lloyd a specimen of a yellow neutral crystallized principle obtained from the root of *Eupatorium Purpureum*. It is quite soluble in hot, slightly so in cold alcohol, and insoluble in water; does not unite with dilute acids, is decomposed by strong sulphuric acid, is tasteless and as far as known has no medicinal value.

Wallace Procter presented a specimen of oil of peppermint, 54 years old.

Prof. Maisch read a paper, by Charles L. Mitchell, on a concentrated solution of salicylic acid. (See page 305.)

J. T. Shinn observed when a solution was made with equal parts of borax and salicylic acid, the taste was very bitter, when, however, two parts of borax were used this was not the case.

Prof. Maisch believed if the estimate of Prof. Kolbe and others as to the virtues of salicylic acid are to be of value to physicians, they must use it in the free state as this is the only way in which it is effective; if salts are employed to effect a more ready solution, some chemical change is most probably the result. (See also p. 330.)

E. M. Boring had in common with many others, had trouble with prescriptions for this acid from physicians laboring under the error in regard to its solubility and the probable changes produced by the use of chemical solvents. Quite recently water of ammonia had been used to effect the solution of a large quantity of the acid in water; this was only another instance in which the elegant pharmacist gave the conscientious dispenser a great amount of trouble. He also exhibited honey which had been obtained by himself from the comb, exposed to direct sunlight; it became candied in a short time, whereas a portion of the same lot in diffused light had undergone no change. He had also examined a sample of yellow wax which had the concave surface said to be characteristic of adulteration with paraffin, yet upon testing with sulphuric acid failed to find any.

Prof. Maisch exhibited a small branch of a plant from Oregon, probably a *Tetranthera*, nat. ord. *Lauracæ*, with a pellucid punctate leaf, having an aromatic odor,

and at first pleasant, but afterwards very pungent to the taste, which seems to indicate that it may possess medicinal properties.

Dr. Pile said that he had made dilute phosphoric acid by the second process of Prof. Markoe, and succeeded very well, the summer temperature being favorable, and little attention being required. Other members had found it necessary to operate at a somewhat higher temperature than had been indicated by Prof. Markoe. Dr. Pile also stated that he found written upon a prescription—"examined and found correct," and supposed this an additional method of indicating the correctness of an unusual dose.

J. T. Shinn exhibited thick filtering paper, well suited for rapidly filtering oils or syrupy liquids without being liable to break; it is sold at 50 cents a pound. Several members gave valuable hints in regard to filtration, and Prof. Maisch hoped more attention would be given to some of the devices for rapid filtration which had been illustrated in the JOURNAL. For filtering large quantities of liquids, where evaporation is not detrimental, Dr. Pile lays the paper flat upon a muslin support, stretched upon a frame, and thus obviates all liability to break.

Several members, having given careful study to the Exposition, contributed to the interest of the meeting by calling attention to many drugs and chemicals which are worthy of notice.

On motion, adjourned to meet on July 18th, 1876.

WILLIAM MCINTYRE, *Registrar*.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The Twenty-fourth Annual Meeting of the American Pharmaceutical Association will be holden in the Hall of the Philadelphia College of Pharmacy, 145 N. Tenth Street, in the City of Philadelphia, on Tuesday, September 12th, 1876, at 3 o'clock P. M.

Ample arrangements are being made by the Local Secretary, in connection with the friends of the Association in Philadelphia, for the comfort and social enjoyment of the visiting members.

It is important that the meeting of 1876 shall fairly represent the most advanced results obtained in the art and science of pharmacy during the past year, and, therefore, the several "standing" and "special committees" should be ready with their reports, and the members who have answers to Queries, and those who propose to read volunteer papers should see to it, that their investigations are finished in time for presentation of the results at the meeting.

Chairmen of standing committees are reminded of the provision contained in Article x, Chapter vi, of the by-laws, by which they are required to furnish a copy of their respective reports, together with a synopsis of the same to the Chairman of the Committee on Papers and Queries, Mr. William Saunders, of London, Ontario. All persons writing papers for the Association must likewise report to the same chairman, previous to the third session (*vide* Article viii, Chapter vi, of the by-laws).

To expedite the business of the Association, it is earnestly requested that all such papers, with synopsis of the same, be placed in charge of the above named chairman, before the opening of the first session.

It will greatly aid the Secretary and Treasurer if members will see that the applications of those whom they propose for membership are properly made out and signed, and placed in the hands of the Chairman of the Executive Committee in time to be acted upon at the first session.

The admission fee and the annual contribution (\$5.00 each,) should accompany the applications, in order to place the names on the roll (*vide* Article iii, Chapter vii, of the by-laws).

In answer to the invitation of the Association, it is expected that the meeting will be honored by the presence of delegates from European Pharmaceutical Associations; this will be an important feature of the meeting, which, together with the great attraction of the Centennial Exposition, and the many objects of interest in and about Philadelphia, cannot fail to render a visit to that city an occasion replete with instruction and with social and intellectual pleasure.

Details with regard to the meeting, and the local arrangements for the reception of the Association, will be given in the circular of the Permanent Secretary, Prof. John M. Maisch, 145 N. Tenth Street, Philadelphia.

GEORGE F. H. MARKOE, *President.*

Boston, June, 1876.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

AMERICAN PHARMACEUTICAL ASSOCIATION.—Most of the Colleges and Associations have informed the Permanent Secretary of the appointment of committees whose object it will be to give to visiting pharmacutists such information as may be desirable to facilitate the object of their visit to this country. A number of pharmacists from foreign countries have already been visiting the International Exposition, and, after extending their trips to various sections of the country, have returned to their homes. Others will doubtless follow as the season advances, and, once this side of the Atlantic, will be desirous of seeing as much as possible of the new world. They may rest assured that fraternal courtesies will be extended to them everywhere.

NATIONAL COLLEGE OF PHARMACY, WASHINGTON, D. C.—The regular monthly meeting of the Board of Trustees of the National College of Pharmacy was held June 13th, Mr. R. B. Ferguson, President, in the chair, J. C. Fill, Secretary.

The Committee on the Progress of Pharmacy, through Mr. Chas. Becker, made a very interesting report, embracing many recent discoveries in pharmacy and chemistry. The committee recommend that conversational pharmaceutical meetings be held at 8 o'clock P.M. on the second Wednesday in each month, the object being to discuss more thoroughly the reports of the committee, to secure an interchange

of opinion as to the value of new remedies and pharmaceutical appliances, and to read original papers upon subjects germane to the objects of the College. The report embraced also a synopsis of pharmaceutical and chemical journals in this country and Europe.

The recommendations were adopted.

Mr. Becker also read a very able paper on salicylic acid. (See page 306.)

The Committee on Weights and Measures recommended that Congress be petitioned to require the use of the metrical system in Government departments.

Letters were read from Profs. E. T. Fristoe, A. M. Read and R. Oldberg, accepting the chairs of Chemistry, Pharmacy, Materia Medica and Botany, to which they were elected at a previous meeting.

A copy (2 vols.) of the "Medical Statistics of the Provost Marshal-General's Bureau" was received from Dr. J. H. Baxter. The Secretary was directed to acknowledge the same, and express the thanks of the College.

EDITORIAL DEPARTMENT.

SOLUBILITY OF READY-MADE PILLS.—The March and April numbers of this journal contained several papers on this subject, in which the relative merits of pills made in the usual manner with an excipient, or subsequently sugar-coated or made by compression have been discussed. Since then we have received a paper from Mr. R. V. Mattison, who is a manufacturer of gelatin-coated pills, and speaks a word in favor of these specialties. We consider it inexpedient to print the entire paper, since it rehearses portions of the former ones, and shall therefore give a brief abstract of his arguments.

Mr. Mattison first objects to the expression of "gelatin-coated or more properly speaking, *glue*-coated," used by one of the writers; admitting that practically one is merely a refined form of the other, he asks: "Was it necessary to appeal to the prejudices of the readers, and is there not commercially such a thing as glue, and also such an article as gelatin?" The proper pharmaceutical association of the terms, he regards as widely different. Admitting that the gelatin-coated pills "swell up," he contends that thereby jelly is formed, which in the natural course of digestion is readily disintegrated. As a simple means of testing the solubility of these and other kinds of pills, Mr. Mattison suggests to place them upon the tongue, and moisten them with saliva, imitating as far as possible the action of the stomach; manipulating in this manner with sixteen varieties of pills, he found the average duration of time that the gelatin coating was in dissolving, to be seventy-five seconds, the shortest being fifty-five and the longest time ninety seconds, when the pills were removed from the mouth owing to the disagreeable taste developed.

Our readers may repeat the experiments by the several methods suggested, and in doing so, the different pills should be placed under precisely similar conditions. In our opinion, *rapidity* of solution is attainable with pills only, when all the material composing them is freely and readily soluble; in the majority of cases, when a rapid action is desired, the physician will have to prescribe the medicine in the form

of solution which is not precipitated by the aqueous liquids of the stomach. In judging of the activity of pills, their solid condition should never be lost sight of, and the materials, more particularly the excipients and coatings, if any, should be such only which in the presence of aqueous liquids are *easily* dissolved, if the quickest activity attainable with pills, is desired. Dry gum acacia is *freely*, but not *readily* soluble in water, even with such a "churning" motion as is attributed to the stomach, and pills made with it are known to have become so hard and practically insoluble, as to pass through the intestinal canal, without having been affected to any great degree; yet such pills (of quinia, &c.), when moistened with saliva and moved about upon the tongue, will in a short time develop a bitter taste.

SWEET GUM.—Some weeks ago, Louis Hughes, Ph. G., has sent us from Dyersburg, Tenn., specimens of branches, fruit and exudation of *Liquidambar styraciflua*, accompanied by the following information, concerning the tree and balsam or sweet-gum.

"The sweet-gum tree is abundant here, and is found in the Bottoms and highlands. In the bottoms it is quite large, from 30 to 50 feet high, with rather few and short branches; in the highlands, it is lower and more spreading. Its appearance is different from what we recognize as the gum-tree in the Middle and Southwestern States. The wing-like ridges of cork are generally found on the bark of the small branches of the lower limbs, and more fully developed in trees growing in the lowlands. The "gum" exudes through cracks in the bark, and wounds in the trunk, during all seasons of the year, and hardens on exposure to the air. I have found it soluble in Alcohol and have made a very nice syrup of it, very much like, and almost as pleasant as Tolu. The "gum" is much esteemed by the resident children for chewing, but they select that which is rather hard. During the last three months, our house has been shipping upwards of 100 pounds per month to a Chewing Gum Manufactory, and it makes a very pleasant article."

For further information on "sweet-gum," the reader is referred to an essay by W. L. Harrison, in "Am. Journ. Pharm.," 1874, p. 161; and to various other papers published prior to that.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Microphotographs in Histology, Normal and Pathological.—By Carl Seiler, M.D., in conjunction with J. Gibbons Hunt, M.D., and Joseph G. Richardson, M.D. Philadelphia: J. H. Coates & Co. 4to. Monthly numbers. Price, 60 cents each, or \$6 per year.

The object of this publication is, on the one hand, to replace the microscope, as far as possible, for those physicians who have neither opportunity nor leisure to make such observations for themselves, and, on the other hand, to furnish microscopists, for comparison, correct representations of typical specimens in the domain of normal and pathological histology. The editors are well known in the medical pro-

fession for their labors in microscopy, and *a priori* it might be expected that only good, reliable and typical specimens will be furnished. The photographs are prepared by Dr. Seiler; the plan of the work and the selection of the specimens is principally due to Drs. Hunt and Richardson, under whose supervision the descriptive and explanatory text is prepared. For the present it is purposed to give in each monthly issue pictures of at least one pathological and three normal specimens, to illustrate the differences between healthy and diseased structures. The various plates of the first two numbers, which are now before us, are admirably executed and elegantly printed; the descriptive text is clear and concise, and free from theoretical speculations. The publication, in our opinion, meets the highest expectations, and deserves to be in the hands of every physician, who does not want to be left behind in his profession.

Annual Report of the College of Pharmacy of the city of New York, 46th Session; and Fifth Annual Report of the Alumni Association, 1876, 8vo, pp. 90.

The pamphlet contains the reports of the officers of the college, and of the board of pharmacy, lists of officers and members of the college and of the association, commencement exercises, with the valedictory and other addresses, minutes of the business and pharmaceutical meetings, and several papers read at the latter.

Centennial Newspaper Exhibition, 1876. New York: Compiled by Geo. P. Rowell & Co. 8vo, pp. 300.

The enterprising firm of G. P. Rowell & Co. have undertaken a newspaper exhibition at the Centennial Exposition Grounds. Through the liberality of a number of proprietors of prominent newspapers, funds were secured to erect a handsome pavilion for the accommodation of all periodical publications of this country. The exhibition is quite interesting, and well worthy a visit. The catalogue, whose title we give above, gives a great deal of information which is of interest to readers and advertisers, also sketches of the career of a number of prominent papers.

OBITUARY.

PROF. HENRY BUIGNET died in Paris, May 9th, aged sixty years. The deceased was born at Chelles, and soon after passing, in 1840, the examinations, as "pharmacien of the first class," purchased the store founded by Planche, and followed the apothecary business for several years, without, however, losing sight of scientific pursuits. In 1850, he became connected with the "Journal de Pharmacie et de Chimie," as one of its editors; in 1855 he was elected general secretary of the Pharmaceutical Society of Paris, and in 1860 he received the degree of doctor in sciences, having presented a thesis containing important original researches on the nature, origin and transformation of sugar in acidulous fruits. Since 1842 he had been attached to the Paris School of Pharmacy as lecturer (*professeur agrégé*), since 1861 as assistant professor, and since 1866 as professor of physics; two years later he became a member of the Academy of Medicine, and in 1871 of the Council of Public Hygiene and Salubrity. The majority of his essays relate to the physics of chemistry; of his chemical investigations, conducted either alone or conjointly with Bussy, we may mention those on the composition of manna, on the influence of heat upon ferric salts, on the preparation, preservation and estimation of hydrocyanic acid, etc.

THE AMERICAN JOURNAL OF PHARMACY.

AUGUST, 1876.

ON FLUID EXTRACT OF IPECAC.

BY HARRY C. WATT, PH.G.

(*Extract from an Inaugural Essay.*)

The principal use of fluid extract of ipecac is for making syrup, hence all preparations other than those which will make a good and permanent syrup, no matter what other good qualities they may have, should be rejected, and those which will make the most perfect syrup should be adopted. The officinal fluid extract of 1870 contains the inert resin¹ in solution, to the removal of which the "Pharmacopœia" of 1860 paid so much attention. The prevailing opinion is, that it is not hard to improve on the present formula, for the preparation soon becomes very thick upon standing.

The formula of Mr. Richard V. Mattison, published in the "Amer. Jour. Pharm.," 1873, p. 481, furnishes a good preparation, but unless there is extra care used in manipulation, the proper strength of the drug would not be represented. Moreover, the preparation itself is not entirely free from the objections common to this preparation, for in spite of the most careful manipulation it will precipitate. The syrup made therefrom shows a resinous separation after standing a long time, which seems to be the case, to a small extent at least, in the best preparations of this syrup. I believe, however, Mr. Mattison's preparation to be almost as near perfect as can well be obtained. The working formula can, however, be improved upon.

The writer prepared fluid extract of ipecacuanha by four different processes, but in each case the drug was similarly treated as to fineness

¹This so-called resin is most likely a decomposition product of the pectin contained in ipecacuanha.—EDITOR.

of powder, length of time in maceration previous to percolation (four days), packing in conical glass percolators, and temperature used in evaporation, as directed by the "Pharmacopœia." Calculated for 16 troyounces, which quantity, however, was not used except in one case, the menstrua and manipulations were as follows:

1st. Acetic acid, $\text{f}\text{̄}\text{̄}\text{̄}\text{i}$; water, 3 parts; alcohol, 1 part. The powder was moistened with the whole of the acetic acid, [mixed with sufficient of the alcoholic menstruum; after maceration as above stated, exhausted with the menstruum (quantity obtained?—Editor); the percolate, after adding glycerin $\text{f}\text{̄}\text{̄}\text{̄}\text{i}$, was evaporated to 1 pt. and filtered.

2d. *U. S. P. menstruum*, exhausted and evaporated to nearly solid consistence, added sufficient water to make $\text{f}\text{̄}\text{̄}\text{̄}\text{viii}$; then added glycerin $\text{f}\text{̄}\text{̄}\text{̄}\text{i}$, the whole thrown upon a filter and water passed through the filter till the filtrate measured $\text{f}\text{̄}\text{̄}\text{̄}\text{xv}$, lastly added glycerin q. s. to make 1 pt. After allowing it to stand 24 hours, again filtered.

3d. *Menstruum Alcohol*.—Percolated drug till half pt. of percolate was obtained; set this aside, and continued the percolation with glycerin and water, 1 part of the former to 7 of the latter, until drug was exhausted; the two percolates were then mixed and let stand for 24 hours, the heavy precipitate filtered out and continuously washed; filtrate, after standing 24 hours, again filtered, the second filtrate evaporated to syrupy consistence, then $\text{f}\text{̄}\text{̄}\text{̄}\text{viii}$ alcohol added to separate gummy matter; evaporated off about two-thirds of the alcohol, upon cooling it gelatinized.

4th. *Exhausted by U. S. P. process*, threw the percolate into four times its bulk of water; filtered at once, let stand 24 hours, and again filtered; added the glycerin and evaporated to desired bulk.

In each case the amount of resinous extractive matter, separated from the various percolates by evaporation or other means before the preparations were completed, was carefully noted as follows:

From No. 1,	.	.	840 grains.
" " 2,	.	.	160 "
" " 3,	.	.	265 " (the unfinished prep.)
" " 4,	.	.	1065 "

In order to test the merit of each menstruum as to its power of exhausting the drug, the dregs of each operation above named were exhausted with alcohol, the percolate evaporated to a solid extract and

weighed. From the various dregs I obtained amounts of extract as follows :

No. 1, 120 grs., entirely soluble in alcohol, insoluble in water.

“ 2, 112 grs., soluble in alco., insoluble in water, gummy, resinous.

“ 3, 138 grs., contained considerable glycerin, semi-fluid.

“ 4, 95 grs., freely soluble in alcohol, insoluble in water.

Of all these preparations I prefer most decidedly No. 4. The preparation represents the medical virtues of the drug, and the syrup made therefrom six months ago still remains clear and transparent, having no signs of precipitation.

The syrups made with the extract from process No. 1 precipitated slightly, but fermented ; with No. 2, a precipitate was formed soon after preparation ; no syrup made with No. 3. Of the fluid extracts, Nos. 1 and 2 have copious precipitates, but No. 4 is perfectly transparent, and free from sediment of any kind.

I cannot see that there is any special advantage in using acetic acid ; there may be a disadvantage, which Prof. Maisch has once hinted at (“*Amer. Journ. Pharm.*,” Feb., 1871). He says “that acetic acid, in contact with organic bodies, is very liable to undergo decomposition ; and, since an organic body in such a condition is apt to predispose others with which it may be in direct contact to similar changes, it is a matter of great moment whether the addition of acetic acid to our officinal fluid extract of ergot and ipecac may not be more detrimental than useful.” On the contrary, Prof. Procter suggested that change seems to be arrested by the introduction of acetic acid to such preparations, whose active principle in the natural condition seems to be held loosely by a weak acid, upon the principle (not entirely proven) of the substitution of a more permanent acid for a less permanent one. Dr. Squibb corroborates this idea in his note on “*Ergot*,” published in the “*Proceedings of the American Pharmaceutical Association*,” 1873, p. 641, where he says that the addition of 1 per cent. of acetic acid to the fluid extract of ergot renders this liquid preparation permanent and without apparent change in activity, after keeping it for six years. My experiments with ipecac seem to substantiate the opinion of Prof. Maisch. The preparation containing acetic acid, after keeping it a few months, began to change ; both the fluid extract and the syrup made therefrom by this time (six months) seem to have undergone

thorough decomposition, while the other preparations exposed to the same influences are still in a good condition.

I may as well state here, that Mr. Campbell's process was tried, but with no success whatever. The drug, it is true, was pretty well exhausted (this is what Mr. C. claims principally for his process), and very well represented in the product, which was at first very pretty and transparent, but in a short time the separation commenced and continued on, until now it is a very muddy and unsightly preparation.

PHARMACEUTICAL NOTES.

BY CARL S. N. HALLBERG, PH.G.

(Abstract from an Inaugural Essay.)

Medicated Waters.—The magnesia process has some advantage in making a clear preparation when finished, but, as the object is to have a pure medicated water, this process is not desirable, as the water is not free from magnesia.

The hot water method has not this objection. I have tried several modi operandi, of which the following is the most satisfactory :

Pour boiling water in a strong bottle or, preferably, a demijohn, drop the requisite amount of oil on a folded filter, and put this filter in the hot water. Upon agitation the filter will be reduced to a pulp, and the oil readily dissolved. After standing a day or two, occasionally shaking it, filter, if necessary, through more pulp.

This water is, perhaps, not quite as clear a preparation as the product of the magnesia process, but is unquestionably superior.

In *Camphor Water*, the magnesia process may also be dispensed with to an advantage. I have obtained satisfactory results by powdering camphor with sufficient alcohol, then triturating with water gradually added, and filtering after several days.

For *Soap Liniment*, the use of castor oil soap has been advocated in some journals, which would, no doubt, answer the purpose admirably. The following modified formula of the "Pharmacopœia," with my experience has worked well :

Take of Castile soap, . . .	4 troy ounces,
water, . . .	14 fluidounces,
camphor, . . .	2 troy ounces,
ol. rosemary . . .	$\frac{1}{2}$ fluidounce,
strong alcohol, . . .	1 $\frac{1}{2}$ pint.

Grate the soap on a common grater, and, having mixed the water with $\frac{1}{2}$ pint of alcohol, pour this on the soap; with occasional agitation it will dissolve in a short time. Dissolve the camphor and oil of rosemary in remainder of alcohol. Add this to the solution of soap, let stand some time and filter. The result is a preparation which will not precipitate. It is not as strongly alcoholic as the officinal, but it contains as much alcohol as is compatible (? Ed.) with it as a preparation.

Aromatic Sulphuric Acid.—The writer recommends S. Whittier's formula ("Am. Jour. Pharm.," 1874, p. 509).

Syrup of Tolu.—In filtering the mixture of tincture of tolu, magnesium carbonate and water, nothing but a flavored water is obtained, as the resin upon which the medicinal virtues depend is left in the filter. It is, therefore, a sacrifice of the medicinal virtues of tolu for the sake of getting an elegant preparation. I have tried to combine the medicinal as well as pharmaceutical properties, and believe to have succeeded, by the following formula: Take the required amount of tincture of tolu, magnesium carbonate and a small quantity of sugar, rub them together and, instead of adding water, add simple syrup (hot), sufficient to make the desired quantity of syrup. After standing a short time, strain slowly through flannel.

Syrup of Ginger may also be made advantageously by this process.

Syrupus Aurantii Corticis.—As this preparation is mostly used as a pleasant vehicle to disagreeable medicines, and especially those derived from iron, I submit a formula, which has the decided advantage in affording a preparation which will not be discolored by an iron preparation. One precaution is necessary, to use a fresh oil; the best plan is to make it up into spirit of orange at once, one part of oil to fifteen of strong alcohol.

Take spirit of orange, carbonate magnesium, sugar and water, and proceed in the same manner as for preparing the syrup of tolu of the "U. S. Pharmacopœia," using the same proportions.

Aromatic Syrup of Rhubarb, as prepared after the officinal process, is generally an unsightly preparation.

I have found the officinal process, with some slight modification, renders a satisfactory preparation. After exhausting the rhubarb, &c., with the alcoholic menstruum, rub it up in a mortar with a small quantity of carbonate of magnesium and some sand. Pack this

loosely in a funnel and percolate it with the water that goes to make up the syrup, mixed with a small quantity of glycerin. Dissolve the sugar in this last percolate, and, while still hot, add the aromatic tincture of rhubarb. The result is a transparent syrup of a beautiful red color, and it will not precipitate.

Syrup of Ipecacuanha.—In simply mixing the fluid extract with syrup a very unsightly preparation is obtained, the resin being precipitated. The following formula affords a much nicer product: Mix the fluid extract with water, let stand and filter out the precipitated resin, dissolve the sugar in the filtrate, and strain.

Tincture Kino.—The writer recommends R. Rother's process ("Am. Jour. Pharm.," 1873, p. 398).

Syrup of Squill.—An important point has been overlooked in the formula for this preparation. As vinegar of squill contains a considerable amount of albuminous matter, it ought to be first brought to the boiling point, when the albumen coagulates and can readily be skimmed off; the sugar should then be dissolved at a low temperature.

ESSENCE OF VANILLA.

GEORGETOWN, D. C., July 12, 1876.

EDITOR AMERICAN JOURNAL OF PHARMACY:—

Enclosed please find formula for essence vanilla, which gives me a better result than any I have ever tried:

Take of vanilla beans, 8 oz.
cut loaf sugar, 72 oz.

dilute alcohol a sufficient quantity. Slice and cut very fine the vanilla beans, then, with the sugar gradually added, reduce in a wedgewood mortar to a coarse powder (it should pass freely through a sieve of 20 meshes to the inch), pack this into a cylindrical glass percolator, and *very slowly* displace with dilute alcohol 1 gallon of percolate. The first of this percolate is a dark syrup, and, if the process is carefully conducted, the last few ounces of the gallon will pass almost void of color or vanilla flavor.

Yours, &c.,

CHAS. BECKER.

POWDERED DRUGS UNDER THE MICROSCOPE.

BY MARK W. HARRINGTON, M.A.

Assistant Professor of Botany in the University of Michigan.

(Continued from page 300.)

III. NATURAL POWDERS.

By this title is meant powders which have not been made by crushing or grinding. There are two pharmacopœal substances of this sort in common use, viz., lupulina and lycopodium.

I. LUPULINA (Fig. 7).

|| Lupulin is a powder consisting of glands scraped from the surface of the bracts of the fertile cone of the hop. The powder is light and volatile. Its color is golden yellow, becoming more orange with age. It has the odor of hops and a resinous taste. When thrown in a flame it flashes. It is not wetted by water; is readily so by alcohol or ether; with sulphuric acid it gives off a strong odor of hops.

The glands consist each of two cup-shaped membranes, set edge to edge and enclosing a mass of brown-yellow resin. In the figure given three of these cups have been separated from the corresponding ones belonging with them. One of these is seen from the side. We look down on the two others. The fourth has the two hemispheres set together, but the hinder one does not appear plainly. The lower membrane is less conical than the upper, and is composed of flattened cells, radially arranged. Sometimes a short

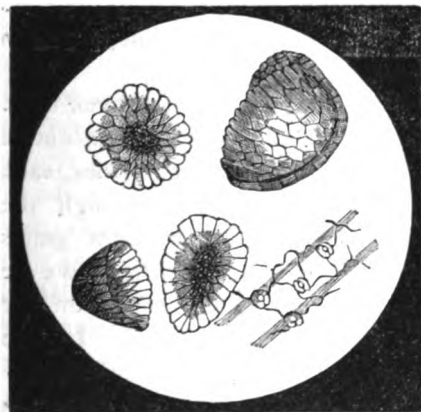


Fig. 7. Lupulina.

stalk is attached to it. The upper membrane is more delicate and less distinctly cellular than the lower. When fresh it is hemispherical, but as volatile portions inside the gland evaporate, this membrane contracts until it finally looks like a stem to the lower portion, the whole presenting the appearance of an umbrella, or rather a thick-stemmed toadstool. This change in shape in the gland, from nearly spherical to

toadstool-like, takes place as the powder becomes old and dried. The diameter of the glands is about 75 μ .

Along with these glands are found fragments of the surface membrane (epidermis), scraped off with them. The figure shows a fragment of this epidermis, with its cells and breathing pores. Separate fragments of resin, with occasional crystals of the same, are found. Hairs from the hop are also sometimes present.

The fragments of epidermis and hairs are impurities, and should not be abundant. Lupulin sometimes contains sand. This can be easily separated by water, in which the powder floats, while the sand sinks. When the grains have so far dried as to become toadstool-shaped, and orange-yellow in color, the powder has lost its valuable properties.

2. LYCOPodium (Fig. 8).

This is a very fine and volatile powder, made up of the spores (seed-like bodies) of the common northern club moss (*Lycopodium clavatum*). The powder is of a light yellow color, odorless and without taste. It does not mix with water, but readily mingles with alcohol, ether, chloroform, etc. Thrown into a flame, it flashes brightly, but in the mass it does not fire readily. It does not turn blue with iodine, nor with iodine and sulphuric acid.

Each grain or spore is a three-sided pyramid, with a convex base.

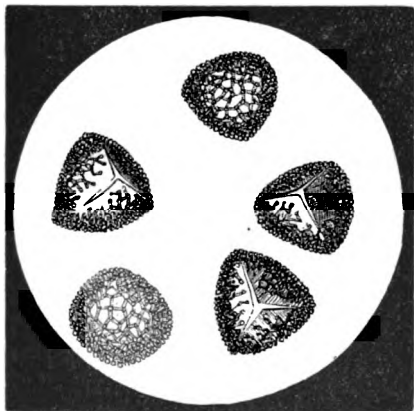


Fig. 8. Lycopodium.

It looks as if it was cut out of a sphere by three planes, each of which passed through the center. In one of the grains represented in the figure we are looking directly down on the apex of the pyramid. In two of the others, we view the pyramid a little from one side. In the remaining two, we are looking at the convex base of the grain. A groove runs down each angle from the apex. The true nature of the markings on the surface cannot be made out

without some care. When carelessly focussed, the grains appear to be covered with hairs of peculiar shape, better seen at the edges. If

the grains are flattened out by pressure, it is found that the markings are really rather irregular six-sided meshes. The same thing can be seen, at a few points at a time, after the grains have been carefully brought into focus.

Each grain consists of a single cavity or cell, surrounded by a double membrane. This is hard to demonstrate, but can sometimes be seen by crushing beneath the thin glass cover. The outer membrane or bag is thicker and brittle, and bears the markings; the inner is thinner and more elastic and is smooth. Within the membrane is a thick liquid with drops of oil. The latter are easily recognized under the microscope. They have a spherical form, and appear bright, especially at the center, because the light is highly refracted by them.

Lycopodium has the reputation of being frequently adulterated, but the writer, in the numerous samples he has examined, has always found it pure, except in one. This contained potato starch, easily recognized by its turning blue with iodine, and by its microscopical characters. In the case mentioned, fully one-third of the powder was starch.

The adulterations given by Soubeiran and others will be given and briefly described, as they may be met in the United States. Ground wood can be recognized by its microscopical structure. It can be separated by a fine sieve. Ground talc can be recognized by its shining, flaky fragments, needing a microscope to distinguish them when ground fine. It can be separated by water, in which the talc sinks and the *lycopodium* floats. Sulphur consists of irregular or crystalline fragments, which have its characteristic yellow color. When *lycopodium*, with it as an adulterant, is burned, an odor of sulphurous acid is given off. When adulterated with dextrin, it becomes lumpy when exposed to moisture. Benj. Lillard has detected this adulteration in this country. *Lycopodium* is also sometimes adulterated with pollen. That of the pines is characterized by being three-lobed—the larger, arched, middle lobe connecting the two others. With this adulteration, the powder has a slight odor of pine. It does not seem to be injured for the uses to which it is put. One such adulteration, found in Ann Arbor, has been reported to me. The pollen of cat-tail flag, or *Typha*, is said to be also employed. The powder is then less inflammable, and has a deeper yellow color. The grain of pollen consists of four equal lobes.

ON THE PREPARATION OF MONOBROMATED CAMPHOR.

BY T. C. LINTHICUM, PH.G.

(From an Inaugural Essay.)

The author has compared three different processes, which have been recently recommended for the successful preparation of monobromated camphor, namely, those of J. M. Maisch ("Am. Jour. Pharm.," 1872, p. 337), J. U. Lloyd (*Ibid*, 1875, p. 165) and of Ed. Dubois ("Proc. Am. Phar. Assoc.," 1875, p. 328). The latter process is similar to that of Gault ("Am. Jour. Pharm.," 1874, p. 587), from which it differs mainly in the treatment of the crude article with carbonate of sodium, and in the asserted almost complete absence of any by-products. According to Dubois, 75 grams of camphor are introduced into a retort, and 80 grams of bromine at once added. The two substances unite with a slight elevation of temperature and become liquid. After standing for two or three hours the mixture is heated by means of a water bath, to 100° C., and when the reaction is completed the contents of the retort are treated with a warm solution of carbonate of sodium, then dissolved in boiling alcohol, filtered and allowed to crystallize.

Having carefully manipulated according to each of the three processes, I feel justified in submitting the following results. My first experiment, made with the process of Prof. Maisch, confirms the result obtained by him in 1872. By the process of Mr. Dubois I was unable to obtain crystals of monobromated camphor. But, upon heating the resulting mass to 132° C. and treating with hot benzin, I succeeded in obtaining handsome, large, needle-shaped crystals. In making the experiment according to Mr. Lloyd, who directs a little over one atom of bromine to one molecule of camphor, I used an apparatus constructed upon the same plan as that employed in the first process, and found that the alkaline carbonate in the receiving vessel was but slightly affected, owing to the small amount of hydrobromic acid which was liberated. After many fruitless attempts to crystallize the brownish, oily mass resulting from this operation, either from warm alcohol or benzin, I transferred it to a retort, and, after heating it to 152° C., crystalized the contents from hot benzin, when crystals of monobromated camphor were obtained, and a large amount of an oily product.

The experiments made have satisfied me that two atoms of bromine are required for one molecule of camphor, and that monobromated camphor is best formed at a temperature not below 132° C.

SALICYLIC ACID.

BY FLAVIUS S. CASE, PH.G.

The author's inaugural essay treats of the chemical history of salicylic acid; of its solubility in various menstrua, its medicinal and other properties. The results of his experiments, made with the view of testing its preservative properties are contained in the following table:

Preparation:	Kept unchanged for the number of days mentioned below, after dissolving in 1 fl.oz.	Pure Salicylic Acid.					Glycerin.		½ gr. Salic Acid	
		Preparation.	1-32 gr.	1-16 gr.	1-8 gr.	1-4 gr.	1-2 gr.	f3 i	f3 ii	f3i Glyc.
Mucilago Acaciæ.....	8 days	50 days	75 days	90 days	.....	.....	.....	20 days	35 days	.....
Syrupus Rubi Idae.....	10 days	.....	.....	70 days	.....	.....	.....	.....	.....	.....
Syr. Papaveris, Ph. Germ.	6 days	.....	.....	.....	.....	.....	.....	.....	.....	20 days
Syr. Limonis.....	7 days	.....	.....	.....	.....	30 days	.....	.....	.....	.....
Infus. Digitalis.....	10 days	.....	.....	.....	.....	50 days	60 days	.....	.....	.....

In each case the experiments were made with five or six vials, all of which were uniformly exposed, the temperature ranging between 70° and 90° F.

BENZOIC ACID AS AN ANTISEPTIC.

BY HENRY TRIMBLE, PH.G.

(Abstract from an Inaugural Essay.)

For the purpose of investigating this property, claimed for benzoic acid, two samples were employed—one obtained by sublimation, according to the U. S. P. process, and the other purchased under the name of "artificial" benzoic acid, supposed to have been prepared from hippuric acid. A good commercial salicylic acid was also procured, which, with the above-mentioned samples, formed the basis of the following experiments, in one-half of which both the sublimed and artificial benzoic acids were used and found to be identical in antiseptic power; the remaining experiments were therefore made with the artificial acid only. The results of the writer are condensed in the following table:

	One part of	2000 parts	4000 parts	8000 parts	2000 parts	2000 parts	1000 parts	4000 parts
		Infus. Buchu	Inf. Buchu	Inf. Buchu	Inf. Colombo	Inf. Gentian. simpl.	Solution of Albumen [1 in 16]	Solution of Albumen water]
Salicylic acid	Spoiled in 8 days	Spoiled in 4 days	.....	Spoiled in 6 days	Spoiled in 19 days	Spoiled in 12 days	Spoiled in 10 days	
Benzoic acid	Remained unaltered after 60 days	Spoiled in 16 days	Spoiled in 5 days	Cloudy, but no change of color in 16 days	Unaltered after 30 days	Unaltered after 60 days	Spoiled in 19 days	

To ascertain the power of salicylic and benzoic acids to arrest decomposition, they were each added in proportion of one part to 2000 of separate portions of cider which had commenced to ferment. In both cases the fermentation, after twenty-four hours, had entirely ceased, and both were perfectly sweet at the end of fifty days, without the appearance of any further decomposition, a rather copious precipitate having separated at the bottom of each.

It must be remembered that the infusions in the above experiments, without the addition of an antiseptic, would have commenced to decompose in about twenty-four hours, and the solution of albumen in about forty-eight hours. In all cases the operations were conducted in a moderately warm place, so as to favor a change as rapidly as possible.

Having carefully compared the above experiments and their results, the following conclusions are submitted :

1. That benzoic acid, sublimed or artificial, possesses valuable antiseptic properties.
2. It has the power to arrest decomposition.
3. Tannic acid (of buchu ?) does not interfere with its preservative properties.
4. As an antiseptic, it is superior, in many, if not in all cases, to salicylic acid. It also has the advantages of being more readily obtained in a state of purity, of being more soluble, and having a lower commercial value.

SIUM LATIFOLIUM, GRAY.

BY ANDREW R. PORTER, PH.G.

(*Abstract from an Inaugural Essay.*)

An umbelliferous plant, growing in California and along the Pacific coast, in damp and marshy places, commonly known as wild parsnip, was brought to the notice of the people there about three years ago, by a man being poisoned by eating some of the root. The case was treated successfully by C. B. White, M. D., U. S. A. (see "*Amer. Jour. Phar.*," 1873, p. 371).

The root was subsequently sent to a former student of this College, Mr. Power, but arriving too late to be investigated during that session by him, was placed in the hands of Prof. Maisch, who very kindly gave it to me to investigate, and to obtain, if possible, the poisonous principle.

Sium latifolium has a short, upright root stock, varying in size from one-half to two inches or more in length, and about the same in diameter, so it becomes almost spherical in outline; bases of leaves are still attached to the crown. It presents a very rough, wrinkled appearance, and is of a gray or yellowish-brown color. It branches at once into a number of large roots, from four to twelve, and even more. These are of the same color, from $\frac{1}{8}$ to $\frac{1}{2}$ or $\frac{3}{4}$ inch in thickness, and 2 to 6 inches long, very much wrinkled longitudinally, somewhat flattened and contorted, and nearly uniform in thickness. On soaking in water, they become about twice as large. The dried root breaks with a very short fracture, is white inside, with a yellowish, spongy medullium and numerous resin cells, which are plainly visible with the naked eye, scattered irregularly throughout the bark. The root has rather an agreeable aromatic odor, and a sweetish, aromatic and somewhat pungent taste.

In attempting to separate the proximate principles of the root, an alcoholic tincture was made, concentrated and precipitated by water. In the clear aqueous solution, Trommer's test indicated the presence of much *sugar*, besides some coloring matter. The precipitated oleo-resin was distilled with water, the distillate containing some *volatile oil*, which was colorless, and had the aromatic odor and warm, pungent taste of the root. The soft residue was separated by hot petroleum benzin into a *fixed oil* and *resin*. The oil was thick, deep-red, of a slight odor and disagreeable taste, soluble in alcohol, chloroform, ether, oil of turpentine, benzin and carbonbisulphide.

The resin was easily rubbed into a reddish-brown powder, which had a very slight odor and but little taste, fusible when heated, and uncrystallizable, soluble in alcohol, chloroform and ether, insoluble in benzin and bisulphide of carbon. This resin appears to be the poisonous principle, since a small portion of it, given to a cat, produced in the course of two hours frothing at the mouth, considerable pain and then convulsions, from which, however, the cat recovered. This resin was not quite pure, since caustic potassa dissolved only a part, leaving a portion insoluble, and not fusible by heat.

The root exhausted by alcohol was found to contain *gum*, *albumen* and *pectin*, but no starch.

An alkaloid having been searched for, with negative result, in the alcoholic tincture, a decoction of the root was distilled with caustic

potassa. The distillate had an alkaline reaction, and its odor reminded of that of conium; but, when neutralized with an acid, the distillate was neither precipitated by tannin nor by iodohydrargyrate of potassium; it was probably *ammonia* contaminated with some odorous product of decomposition.

SOME PRACTICAL EXPERIMENTS WITH THE SUNFLOWER.

BY G. C. WITTSTEIN.¹

Helianthus annuus is largely cultivated in Russia and Hungary, partly on account of the agreeable fixed oil and partly for the presscakes, which are a valuable fodder. 16,000 strong, healthy plants can be raised on one Bavarian acre (Tagwerk), which holds 3,407 square metres. By numerous experiments, it was ascertained that each individual weighs on an average $5\frac{1}{2}$ kilos, while fresh, and of this weight $\frac{1}{2}$ kilo is due to the seeds, one-half of the remainder ($2\frac{1}{2}$ kilos) being stem, and the other half ($2\frac{1}{2}$ kilos) leaves, receptacles and roots. The yield per acre is therefore 40,000 kilos of stem, 40,000 kilos of leaves, etc., and 4,000 kilos of fruit (seeds). The entire plant, deprived of the fruit, was cut fine, when, on drying in the air, it lost 68 per cent., and at 110°C . altogether 72.25 per cent., or nearly three-fourths of its weight; the remaining 27.75 parts left on incineration 1.9 parts of ashes, in which were found 62.199 potassium carbonate, 2.930 sodium carbonate, 7.000 potassium chloride and 2.772 sodium chloride, or altogether 74.901 per cent. soluble in water, and 25.099 per cent. insoluble in water, consisting of 4.210 calcium carbonate, 13.916 calcium phosphate, 0.672 aluminum phosphate, 0.323 ferric phosphate, 5.291 magnesia and 0.687 silicic acid. By leeching the ashes and evaporating the solution the resulting potash should contain 82.83 potassium carbonate; however, in consequence of a partial reaction with the calcium phosphate, the amount of carbonate was found to have decreased to 75.50 per cent., yielding still a good commercial potash.

Different samples of fruit yielded from 41 to 60 per cent. of shells, and from 40 to 59 per cent. of kernels, the latter yielding 16.25 to 28 per cent. of fixed oil, calculated for the weight of the fruit, or 40.6 to 50.5 per cent., calculated for the kernel alone. The oil was ex-

¹ Abstract from a paper published in "Archiv der Pharmacie," April, and communicated by the author.

tracted by ether; if obtained by pressure, of course considerably less would be obtained.

From the results obtained, as above, the author concludes that the cultivation of the sunflower would be profitable, inasmuch as a Bavarian acre would yield from the plants (deprived of the fruit) 1,525 kilos ashes, yielding 1,250 kilos of potash, and from the fruit, by extraction, 870 kilos of oil with 3,120 kilos of residue, or by pressure, 720 kilos of oil and 3,280 kilos of presscakes.

The air-dry fruit lost at 110°C. 6 per cent. of water and yielded 4.173 per cent. of ashes, 20.273 per cent. of which was soluble in water. It consisted of 14.475K₂O, 4.714Na₂O, 1.405Na, 6.811CaO, 10.960MgO, .227Al₂O₃, 1.427Fe₂O₃, 2.162Cl, 2.086SO₃, 31.848P₂O₅, 10.811SiO₂, and 13.074CO₂.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Princewood bark, a febrifuge of the Bahamas.—The name of princewood is given to two small West Indian trees, *Cordia gerascanthoides* Kth., nat. ord. Boraginaceae, and *Hamelia ventricosa*, Sw. nat. ord. Rubiaceae. Both are noted for their timber, which is lightish brown with dark brown marking, and used for table and cabinet work. Samples of princewood bark, recently received at the Kew Museum, were ascertained, by Mr. John R. Jackson, to be derived from *Exostemma caribæum*, R. S., nat. ord. Rubiaceae, which, according to Grisebach, is a fragrant shrub widely distributed in Jamaica, Antigua, Dominica, Trinidad, Cuba, Mexico and Guiana. The bark is smooth, of a deep reddish-brown, but somewhat greyish on the outside; under an ordinary lens, numerous small crystals are seen distributed over its surface. It breaks with a short, woody fracture; in flavor it is at first sweet, changing to an astringent bitterness; it readily tinges cold water to the color of dark brandy, and imparts to it, in a few hours, opaqueness, a strong, earthy smell and bitter taste. It has been known as the Jesuits' bark of Jamaica, and is sometimes called the seaside beach.

Exostemma floribundum and *brachycarpum*, likewise occurring in the West Indies, are called "quinquina piton," or "China caribæa" (Grisebach). *E. cuspidatum*, a small tree, native of Brazil, is there called "quino do mato;" *E. corymbiferum* is a native of the islands of

Pacific Ocean, and *E. philippicum* indigenous to the Philippine Islands; both have bitter medicinal barks.—*Pharm. Jour. and Trans.*, 1876, February 26.

Chelidonium majus.—E. Masing, of Dorpat, has made a large number of determinations of the moisture and alkaloids contained in the herb, root and fruit of this plant, which was collected during five succeeding months, in periods varying from three to ten days. The amount of moisture varied in the herb between 80.35 and 91.34 per cent., and in the root between 66.76 and 85.26 per cent. The total amount of alkaloids was determined by digesting 10 grm. of the fresh part of the plant with 25 cc. of acidulated water and 75 cc. of alcohol for 12 hours, the tincture evaporated to expel the alcohol and then diluted with water to 100 cc. 25 cc. of this solution was then titrated with Mayer's solution $\frac{1}{10}$, each cubic centimetre of which indicates 0.001675 grm. chelidonina; a separation of chelidonina and chelerythrina was not attempted, owing to the large number of determinations made. The amount of test solution required varied between 4.0 and 13.0 cc. for the herb, 4.4 and 16.2 cc. for the root and 5.3 and 9.7 cc. for the fruit.

The rapid decrease of the alkaloid at the beginning of flowering and the subsequent rapid increase appear to indicate that the alkaloids are used up for the formation of albuminous substances, which are deposited in the ovaries. Another cause of the vacillation is found in the weather, the consumption of the alkaloids exceeding their production during moist and rainy weather. A well-manured soil seems to favor their production, since the cultivated plant showed about double the amount of alkaloids, as compared with the wild plant, collected at the same time.—*Archiv d. Phar.*, 1876, March, 224–228.

Cotoin.—Julius Jobst received coto-bark from London in 1873 (see *Amer. Jour. Phar.*, 1875, p. 541), and obtained last year a crystallizable body which appears to be the active medicinal principle of the bark. To obtain it the powdered bark is exhausted by ether, the tincture concentrated by distillation, the residue poured into a capsule and mixed with six parts of warm petroleum ether (light petroleum benzin). After the separation of a large quantity of resin, the benzin solution is poured off and allowed to crystallize. The crystals are collected, pressed and several times recrystallized from water. Thus prepared, cotoin forms yellowish-white, light prismatic crystals, has a very biting

taste, is sparingly soluble in cold, but more in warm water, and readily soluble in alcohol, ether, chloroform and carbon bisulphide. Benzol and petroleum benzin dissolve it less readily; it crystallizes from alcohol in large sulphur-yellow prisms, fuses at 124°C . (255.2°F .), and dissolves in alkalis with a yellow color, being reprecipitated by acids. Nitric acid dissolves it with a blood-red, sulphuric acid with a brown-yellow, and muriatic acid with a yellow color. The aqueous solution is neutral, yields with subacetate of lead a bright, yellow precipitate, and with iron salts a brown-red coloration or, when concentrated, a blackish-brown precipitate, and reduces in the cold, silver and gold salts, also Fehling's solution—the latter rapidly on warming. Its composition, according to an analysis by I. A. Todd, is $\text{C}_{21}\text{H}_{20}\text{O}_6$, and of its lead compound $\text{C}_{21}\text{H}_{20}\text{O}_6 + 2(\text{PbH}_2\text{O}_2)$.—*Neues Repert. d. Phar.*, 1876, 23–28.

Taxina.—W. Marmé obtained this poisonous alkaloid by exhausting the powdered seeds or leaves of *Taxus baccata* with ether, distilling off the ether and exhausting the residue with warm acidulated water. From the colorless filtrate, the alkaloid is precipitated by alkalis in snow-white flocks, which, when collected, form a white crystalline powder, which is soluble in acidulated water, alcohol, ether, chloroform, benzol and carbon bisulphide, but not in petroleum benzin. Concentrated sulphuric acid colors it red; other acids dissolve it without coloration. It is precipitated by all reagents characteristic for alkaloids, except by the chlorides of platinum, gold and mercury, and by platino-cyanide of potassium. It contains nitrogen, but crystallizable salts could not be obtained.—*Chem. Cent-abl.*, No. 11.

The Inula camphor of J. Kallen ("Amer. Jour. Pharm.," 1874, 298) has been further examined by the same chemist. It was obtained in the form of white crystals by distilling elecampane root with steam. On pressing the crystals between bibulous paper, and distilling the latter with water, a yellowish liquid, *alantol*, is obtained, having an aromatic taste and the odor of peppermint, and boiling near 200°C . Its composition is $\text{C}_{10}\text{H}_{16}\text{O}$.

The crystals remaining after pressing, are repeatedly crystallized from dilute alcohol, when they form colorless prismatic needles, of a faint odor and taste, fusing at 66°C . and sublimable, readily soluble in alcohol and ether, but slightly in water. It is the anhydrid of a new acid (*alantslure*) of the formula $\text{C}_{15}\text{H}_{20}\text{O}_2$; the acid is $\text{C}_{15}\text{H}_{22}\text{O}_3$, crys-

tallizes in fine needles, fuses at 90—91° C., and yields rather unstable crystallizable salts.—*Ber. Deutsch. Chem. Ges.*, 1876, 154—157.

Hesperidin.—Emanuele Paterno and Giovanni Briosi have obtained this principle pure by a modification of Pfeffer's process. The cut and bruised oranges are covered with diluted alcohol, potassa solution is added in excess, the liquor filtered after two days and impure hesperidin precipitated by muriatic acid; the precipitate is boiled with acetic acid for 8 or 10 minutes, and, after cooling, filtered from the dark resinous mass. After two days the filtrate commenced to separate white, fine needles and spheric crystals of nearly pure hesperidin, the separation continuing for several months. Four thousand ripe oranges yielded about 180 grams of hesperidin, which was also obtained from the ripe fruit of *Citrus limonum* and *C. medica*. It fuses between 243° and 245°C., is nearly insoluble in the simple solvents, but soluble in alkalis and in anilin, from which it is precipitated by ether.—*Ber. D. Chem. Ges.*, 1876, 250—252.

Oil of Parsley.—Trommsdorff obtained from 15 kilos parsley fruit 90 grams, and by shaking the aqueous distillate with benzol, 16 grams more of the volatile oil, which was examined by E. von Gerichten. It commenced to boil at 160°C., nearly all the terpen having come over below 210°. Between 270° and 290° a heavy yellowish-green, very refractive, uncrystallizable liquid was obtained, and above 300°C. brown decomposition products. By repeated rectification of the first portion, the pure, colorless terpen was obtained, boiling between 160° and 164°C., and having an intense odor of parsley. Its specific gravity at 12°C. is .865, and its rotation power for yellow light and a column of 100 mm. = —30.8°. Muriatic acid colors it gradually brown and destroys the parsley odor. Terpin and solid chlorhydrates could not be obtained.—*Ibid.*, 258—260.

The Conversion of Brucia into Strychnia by means of nitric acid, as reported by Sonnenschein ("Am. Jour. Phar.," 1875, p. 345), does not appear to be as readily effected. A series of experiments, made by A. J. Cownley, led him to the conclusions, that 1, if brucia be treated with enough dilute nitric acid to acidify the solution, there is no change in color, and caustic fixed alkalis precipitate the alkaloid; 2, if enough acid be used just to form the red color without the aid of heat, there is a partial precipitation with alkali; 3, if gentle heat be used in presence

of acid in excess, more than sufficient to color the solution, caustic alkali fails to produce a precipitation, and if further heat be used after the acid has been added, yellow crystals soluble in alkali are deposited. These results point to the production of a nitro-compound, probably of Laurent's cacothelin ("Am. Jour. Phar.," xix, 237; xx, 115). The results further prove that the detection of brucia, and even of strychnia, in an analytical inquiry will become doubtful, if the presence of nitric acid, even dilute, be permitted. *Phar. Jour. and Trans.*, April 22, p. 841. (See also papers by Rosengarten, *Am. Jour. Phar.*, xx, 114; Baumert, *Ann. d. Chem. u. Phar.*, lxx, 337, and Strecker, *Comp. Rend.*, xxxix, 49.

Amyrin.—Eugene Buri obtained amyrin by treating elemi with cold 90 per cent. alcohol, and recrystallizing the residue repeatedly from hot alcohol. It forms colorless silky needles, united to globular masses, fuses at 177° C. and congeals, far below the melting point, to a transparent, resinous mass, which crystallizes again from alcohol. It is soluble in ether, and freely in chloroform and carbon bisulphide. 100 parts of alcohol of 92.5 per cent. dissolve at 16° C. (60.8° F.) 3.6 parts. Its alcoholic solution affects polarized light + 4.5°. It is sublimable when carefully heated in thin layers. Ultimate analysis gave results agreeing with the formula $C_{22}H_{42}O = (C_6H_8)_3 \cdot H_2O$, to which also the acetyl substitution product points. By the action of nitric acid, oxalic and an amorphous resin acid were obtained. The products of destructive distillation could not be separated into bodies of uniform boiling point; the first portion had an agreeable odor and aromatic taste.—*Buchner's N. Repert.*, 1876, 193–203.

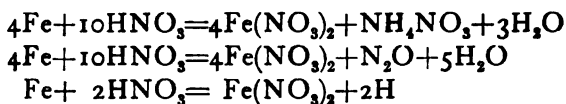
Alkaloid from Capsicum.—J. C. Thresh treated the fruit of *Capsicum fastigiatum*, deprived of their non-acrid seeds, with benzin, which yielded 20 per cent. of a red fatty substance, of intense acidity. This was dissolved in ether, the solution shaken with dilute sulphuric acid, the free acid partially neutralized with barium carbonate, filtered, evaporated, and the oily residue treated with alkali and agitated with ether. On evaporating the ether, a small quantity of an oily alkaloid was obtained, smelling somewhat like conium, having a mawkish, persistent, but not acrid taste, and yielding crystals on being combined with HCl and SO₃. The alkaloid is undoubtedly the one observed by Felletár in 1868, and since then confirmed by Dragendorff and Flückiger.—*Pharm. Jour. and Trans.*, May 27, p. 941.

CONTRIBUTIONS FROM THE SCHOOL OF PHARMACY OF THE
UNIVERSITY OF MICHIGAN.

Communicated by PROF. ALBERT B. PRESCOTT.

I. *The Preparation of Liquor Ferri Nitratis.* By F. T. BOWER, Ph.C.

This solution, made by the U. S. P. process, is variable in two particulars, namely, in the proportion of iron to the solution, and in the proportion of acid to iron. From the last-named variation the ferric salt may be more or less basic or possibly normal. As with other ferric salts, the more basic the darker its color; the normal salt in solution of U. S. P. strength being very light in color, and in presence of free nitric acid almost colorless. The "Pharmacopœia" specifies its color as pale amber; but if the iron be dissolved in strict compliance with the directions, the finished solution is darker than pale amber—and this is true of the solution commonly in use. By the addition of nitric acid it can be made pale, in proportion to the amount added. The causes of the variation lie, firstly, in the uncertain action of iron on the cold dilute nitric acid; slight differences in temperature and differences in the equilibrium of the nitric acid change the decomposition products of the acid and the proportion of ferrous nitrate it can make. Even if the direction to avoid red fumes be so strictly obeyed that no trace of nitric oxide is formed, we may have the acid breaking up in at least three different ways, as follows:



Again, the action of the second portion of nitric acid, added to change the ferrous to a ferric salt, will be varied by conditions. The chief decomposition product is undoubtedly nitric oxide, but other products may occur to some extent. In using nitric acid to make ferric solutions of sulphate and chloride, we know, by experience, that the only exact direction is to add *sufficient* nitric acid, and afterward expel any excess; but here, with a variable quantity of ferrous nitrate to act upon (to oxidize and then make normal), we have no guide but to heat to 130° and add the two troyounces of nitric acid.

The "Pharmacopœia" directs that one fluidounce of the solution shall furnish "from eight to ten grains" of ferric oxide. Five samples of the solution were assayed, the first two obtained at drug stores,

and the last three prepared for the purpose according to the U. S. P., but in smaller quantities :

One fluidounce of No. 1 gave 12.69 grains ferric oxide.

"	"	"	2	"	11.99	"	"	"
"	"	"	3	"	16.93	"	"	"
"	"	"	4	"	11.28	"	"	"
"	"	"	5	"	8.46	"	"	"

An attempt was made to prepare the solution of nitrate of iron by adding solution of tersulphate to an alcohol solution of potassium nitrate, but it was found that with the precipitate of potassium sulphate was a precipitate of *basic* ferric nitrate. This, on warming to expel the alcohol, became so basic as to be insoluble in water. The experiment was repeatedly varied, without full success.

The following process was then devised by calculation and experiment, and in repeated trials it made a satisfactory liquor, one fluidounce of which, in each instance, gave very nearly ten grains of dry ferric oxide :

Take of	solution of tersulphate of iron,	.	.	7 fluidounces
	water of ammonia,	.	.	8½ fluidounces
	nitric acid,	.	.	3 troyounces and 145 grains
	distilled water,	.	.	a sufficient quantity

To the water of ammonia, mixed with twelve fluidounces of water, add, stirring constantly, the solution of tersulphate of iron, previously mixed with twelve fluidounces of water. Filter and wash the precipitate until the washings render solution of chloride of barium only slightly turbid. Let the precipitate drain and dry till it can be removed from the filter without loss. To two troyounces and 250 grains of the nitric acid, mixed with an equal volume of distilled water, add, without heat and stirring constantly, the precipitate of ferric hydrate until it no longer dissolves. Filter the solution, and wash the filter with repeated small portions of distilled water, adding the washings to the filtrate. Then add to the solution the remainder of the nitric acid and (after it has attained a pale amber color) add enough distilled water to make the liquid measure 36 fluidounces.

One fluidounce of this solution should furnish 10 grains of dry ferric oxide.

II.—*Comparison of four Processes for the Morphimetric Assay of Opium.* By JAMES LYNN, Ph.C.

Four samples of opium, obtained at different reputable pharmacies, were each assayed by the four processes. The opium was dried, to lose no more weight, at 100°C.

PERCENTAGES OBTAINED.

	No. 1.	No. 2.	No. 3.	No. 4
1. Procter's Staples' process, ¹	11.22	13.62	9.14	12.69
2. Mohr's process, ²	11.40	13.48	9.30	12.77
3. Hager's Jacobson's process, ³	11.68	13.86	9.46	12.98
4. Dragendorff's Mayer's process, ⁴	12.33	14.00	10.40	13.06

Of the three *gravimetric methods*, Staples' gives much the purest and best crystallized morphia, being nearly colorless and readily detached and gathered. For this reason Staples' is preferred by the operator to Mohr's or Hager's method, unless time is an important object. Hager's is the quickest and simplest, being completed in four to six hours, while the product is about as pure as Mohr's; the crystals from both these methods being imperfect and colored. The yield is greater in Hager's than in Staples' process, but very likely the amount of absolute morphia is not much greater.

In any gravimetric method the morphia separates by crystallization slowly, and, we must suppose, approximately, and that a weighable

¹"Proc. Am. Phar. Asso.," 1870, p. 129; "Am. Jour. Phar.," 1871, p. 65. (First method given by Procter.) The plan of the U. S. P. preparation of morphia.

²"Annal. der Chem. u. Phar.," B. 35, S. 120; "U. S. Dispensatory." Third method given by Procter, as above quoted.

³"Hager's Untersuchungen," II, 176; "Am. Jour. Phar.," 1871, p. 224. Founded on Mohr's.

⁴"The Volumetric Method. Mayer, "Am. Jour. Phar.," 1863, p. 20; Dragendorff, "Werthbestimmung starkwirkender Drogen," p. 86. This method was employed as follows: Three grams dried powdered opium were exhausted with benzene, the adhering benzene fully evaporated, the dry powder macerated in water for 12 hours, then percolated on a filter with water until the water passed colorless. The dilute percolate acidulated with sulphuric acid, and the reagent added from the burette in portions so limited as to prevent excess, allowing the precipitate to subside after each addition. At intervals, a drop of the clear supernatant liquid is taken on a dark-colored glass slide, with a drop of reagent from the burette, this portion being rinsed into the tested solution each time until the addition is completed. Each c.c. of a solution of 13.546 grams mercuric chloride and 49.8 grams potassium iodide in water to one litre, precipitates 0.02 grams morphia.

proportion of morphia remains in the mother liquors of the gravimetric processes is strongly supported by the results of the volumetric method. Here weighable portions of the alkaloid do not escape determination, and no non-alkaloidal matter obtains determination. Other alkaloids, however, may be included, notwithstanding the use of benzene. Also, the *execution* of the volumetric process may suffer appreciable variations. At any rate, it must be held that the greatest exactness is *attainable* by the volumetric method.

III. *Valuation of Powdered Ipecacuanha Root and Dover's Powder, as found in the Market.* By T. M. STEWART, Ph.C.

All the specimens were obtained from different retail drug stores in Detroit and Jackson, Michigan.

The ipecacuanha was assayed by the process lately recommended by Dragendorff,¹ the drug being extracted first by acidulated water, and then by alcohol, the pectin filtered out from the concentrated solution, when the alkaloid is either determined volumetrically by potassium mercuric iodide or extracted by chloroform or benzene in presence of barium carbonate, and the residue thereof weighed. (One c.c. Mayer's solution precipitates 0.0189 gram emetia.)

Both volumetric and gravimetric ways were found to give concurring duplicate results, and the two ways gave results corresponding closely with each other; but the volumetric method leaves less danger of loss in operating. Two grams were taken each time.

POWDERED IPECACUANHA.

No. 1.	1.75 per cent. emetia.	No. 5.	1.90 per cent. emetia.
" 2.	1.45 " "	" 6.	2.00 " "
" 3.	2.10 " "	" 7.	1.90 " "
" 4.	1.60 " "	" 8.	2.05 " "

Average, 1.84 per cent. emetia.

All the numbers were examined microscopically and chemically for adulterations, especially for almond meal, chalk and antimonium potassium tartrate, but no adulterations were found, except a little extraneous woody fibre.

The compound powder of ipecacuanha was assayed as follows:² Three grams of the powder were extracted with 85 per cent. alcohol

¹ "Werthbestimmung einiger starkwirkender Drogen." (1874) S. 37.

² "Dragendorff's Werthbestimmung," S. 96.

(the residue tested for adulterations); the dry residue from the alcohol dissolved in acidulated (sulphuric acid) water, filtering if necessary, and the narcotina removed by washing the acid solution with ether. After addition of excess of barium carbonate, the solution is now extracted with benzene (several portions), the residue from evaporation of the benzene being weighed as emetia (confirming by dissolving in acid water and titrating with potassium mercuric iodide). The solution exhausted with benzene is washed with amylic alcohol (several portions), and the residue from evaporation of the amylic alcohol weighed as morphia (confirming volumetrically by potassium mercuric iodide after dissolving in acidulated water). The ether and the amylic alcohol should be water-washed.

DOVER'S POWDER.

No. 1, 0.20 per cent. emetia, and 1.03 per cent. morphia.					
" 2, 0.16	"	"	" 1.00	"	"
" 3, 0.23	"	"	" 1.06	"	"
" 4, 0.20	"	"	" 1.03	"	"
" 5, 0.13	"	"	" 0.93	"	"
" 6, 0.13	"	"	" 1.00	"	"
" 7, 0.26	"	"	" 1.06	"	"
" 8, 0.23	"	"	" 0.96	"	"
Average, 0.19	"	"	" 1.01	"	"
U. S. P. standard,			1.00	"	"

The average of 0.19 per cent. in Dover's Powder equals 1.90 per cent. emetia in ipecacuanha.

All the samples of Dover's Powder were examined for adulterations, organic and inorganic, but none were found.

CONTRIBUTIONS TOWARDS THE HISTORY OF SOME DRUGS.¹

BY PROFESSOR FLÜCKIGER.

In writing our "Pharmacographia," my late friend Hanbury and myself have endeavored to trace the history of each substance as far back as possible, and to ascertain the date of the introduction into pharmacy of drugs—especially of those furnished by foreign countries.

¹ Abstracted from the author's "Documente zur Geschichte der Pharmacie." Halle, 1876, p. 96.

Many curious facts are connected with the way of their propagation throughout Europe, both in early and in the middle ages. As to England, I am entitled to suppose that there are existing but an extremely limited number of sources of valuable information about the subject under notice which had escaped the careful investigation of my lamented friend. As to the continent, there is in the library of the British Museum an interesting volume marked $\frac{777.c}{5}$ (Pharmacopœia), and entitled "*Valor sive taxatio omnium materierum medicarum . . . quae in officinâ pharmaceutica Swinphordianâ venundantur*," printed at Giessen, 1614. This is the tariff of drugs and compound medicines which were to be met with in the pharmaceutical shop of Schweinfurt on the Main, then one of the numerous free cities of the old German Empire. The establishment (Apotheke) was not a private business, but remained from A.D. 1412 until the year 1803 the property of the commonwealth of that imperial town, and was managed—under the superintendence of the physicians—by an apothecary appointed by the magistrate. The tariff was therefore settled by this authority. The same may be said with regard to many other German towns, a fact which, no doubt, depends upon a good deal of public interest already devoted in those early times to pharmaceutical matters. Thus the volume alluded to contains not only the "tax" of Schweinfurt, but also those of Bremen (1644), of Basel (1647), of Rostock (1659), of Quedlinburg (1665), and Frankfurt (1669). Daniel Hanbury at once appreciated the usefulness of these documents, which we subsequently made free use of, as may be seen from several pages of the "Pharmacographia" (77, 177, 234).

It was evident that similar medicine tariffs must have been in vigor throughout the numberless States, so very different in size, which were formerly termed the German Empire; and not only tariffs, but most of them had their own pharmacopœia and medico-pharmaceutical laws. Since my late friend first drew my attention to the said volume in the British Museum, I have succeeded in perusing—for the same purposes—somewhat more than one hundred of similar lists or tariffs of German towns, ranging from the year 1558 down to the middle of the last century. They are scattered in various public libraries throughout Germany, but I learn from A. N. von Scheerer's "*Literatura Pharmacopœarum*," Leipzig, 1822, p. 232, that there are about forty more of

the same periods which I have not yet been able to consult. No other country, as far as I know, can boast of such a number of similar documents, which I think must be considered as an evidence of a somewhat advanced state of the pharmacy in those ages, although the fact may partly be explained by the extreme, and we may say absurd, self-government then prevailing among the Germans. In 1872 at last the way has been cleared for ever by the "*Pharmacopœa Germanica*."

In abstracting the said tariffs, I have met with a good deal of information which may some day prove useful to any author engaged in the history of Pharmacy. I have therefore communicated my notes to the *Archiv der Pharmacie*, volumes 204 and 205 (1875 and 1876), from which they are reprinted under the title "*Documente zur Geschichte der Pharmacie*," Halle, 1876, 96 pages. A few pages from this pamphlet may be permitted to be quoted in this place in order to show that they afford even some further elucidation to questions which had been treated with a certain amount of care in the "*Pharmacographia*." The sources from which the following facts have been borrowed are pointed out in the pamphlet :

Balsamum Canadense is stated ("*Pharmacographia*," p. 553) to have been noticed in England A.D. 1761, but in my "*Documente*," p. 92, it is found to have been sold at Strassburg as early as 1759 as a current article of the pharmacy of that country.

Balsamum Copaivæ.—Its history is somewhat exhaustively traced out in "*Pharmacographia*," p. 201, and also (p. 184) that of a certain white American balsam, the latter being derived from several species of *Myroxylon* and *Myrocarpus*. It would appear from some tariffs abstracted in the "*Documente*," pp. 47, 52, 65, 68 and 69, that in some cases *Balsamum Americanum*, *s. Indicum*, *s. Mexicanum album* was probably intended for copaiba—for instance, in the private tariff of an apothecary of the city of Görlitz, of the year 1629. But in the *Pharmacopœia* of Amsterdam, A.D. 1636, *editio sexto*, *Balsam. Copæ. yvæ* is distinctly enumerated. The authors of the "*Pharmacographia*" had not been able to find it mentioned in English pharmacy previous to the year 1677.

Balsamum Peruvianum.—Perhaps *Balsamum Indicum*, of the tariffs of 1605 and 1607, quoted in the "*Documente*," pp. 35 and 36, may mean Peru balsam; it is, however, expressly termed *Balsamum Peruvianum* in the tax of Mainz (Mayence), A.D. 1609, and what is more curious,

the pods of the tree, *Fructus balsami indici*, are met with in the lists of Wittenberg in 1646, and of Nordhausen, 1657. These pods are still occasionally imported on account of the fragrant resinous contents of the large ducts around the seed. Their fragrance, which I am told is much appreciated by perfumers, is quite different from that of the balsam itself (see "Pharmacographia," p. 184). *Balsamum Indicum nigrum fluidum* is another name frequently applied to Peru balsam; *Balsamum Hispanicum* ("Documente," pp. 45 and 49) may rather mean balsam of tolu. It is hardly possible to say what was *Balsamum Americanum s. Indicum verum*, p. 41.

Balsamum hispanicum siccum seu americanum resinosum in the tariff of Schweinfurt, 4th edition, 1644 ("Documente," p. 49), as well as *Balsamum Indicum durum* of Ulm, 1648 ("Documente," p. 53), cannot be doubted to mean balsam of tolu. The product of *Myroxylon Pereiræ*, which is exclusively prepared on the balsam coast of San Salvador, having been formerly carried to Callao, the chief port of Peru during the Spanish dominion, the name of Peru balsam was given to it. This may account for the appellation of *Balsamum hispanicum*, which appears to have been bestowed upon the balsam of tolu, inasmuch as it used to be immediately shipped for Spain—as it is still—from the ports of New Granada.

The earliest express mention of *Balsamus toltanum*, I have met with in pharmaceutical tariffs occurs in that of the city of Frankfurt of 1669, quoted in the "Documente," p. 65. From what we stated in the "Pharmacographia," p. 177, it is probable that the drug was then likewise used in England, but there is no proof of the fact as far as I can see; I would be glad, however, to be corrected in this opinion.

Benzoin began to be introduced as a commercial article in the beginning of the sixteenth century ("Pharmacographia," p. 362). It was abundantly obtainable in the middle of that century, for Hieronymus Cardanus states in his work, "De la Subtilité," French translation, 1556, p. 160, that "belzoi est de vile prix pour l'abondance." Benzoin, according to the custom of that period, was then submitted to destructive distillation, by which it yielded benzoic acid, which was first noticed by the famous French astrologer, Michel de Nostredame,¹ about the year 1556. This preparation appears to have quickly come

¹ "Excellent et moult utile Opusculé à tous necessaire qui desirent avoir cognoissance de plusieurs exquisés receptes." 1556.

into more general use; it occurs in the list of Görlitz (east of Dresden) of 1629, under the name of *Benzoi flores*.

Arnotto, the pulp of the fruit of *Bixa Orellana*, the well known dye, occurs in tariffs of Wittenberg, 1646, Budissin, 1660, Leipzig, 1669, under the name of *Orlian*, which it still bears in German.

Cascarilla bark.—The Bahamas having been in the possession of the English from 1629 to 1641, the authors of the "Pharmacographia" supposed it to have been first introduced in Europe by way of England, but no evidence at all has been found to prove the correctness of this suggestion. The said islands were occupied in 1641 by the Spaniards, and to them apparently is due the introduction of this bark. It bears a certain resemblance to quills of cinchona barks, and was, therefore, first noticed by the name of *China nova*, or *cascarilla*, which designations were, no doubt, of Spanish origin. It is said, however ("Documente," p. 76), that it had first been mentioned in the pamphlet—"De machinis fumiductoriis," Hamburg, 1686, by J. A. Stisser, Professor in the University of Helmstedt, near Brunswick. I have not seen this pamphlet, nor that of V. G. Salat, of Valencia, Spain—"Unica quaestiuncula, in qua examinatur pulvis de Buarango vulgo *Cascarilla* in curatione tertianæ." Valentiae, 1692. Both these pamphlets appear to be extremely rare, the first being not even quoted in Haller's "Bibl. Botanica." But in the list of Minden, 1691 ("Documente," p. 74,) I have found *China nova*, together with *China de China*—i. e., true Cinchona. There can be no doubt that this refers to *cascarilla*, for in another tariff of 1694 ("Documente," p. 74), published at Gotha, *Cortex China novæ seu Schacorillæ* is quoted as well as in several other lists abstracted in the "Documente."

Catechu is said in the "Pharmacographia" to have been unknown in Europe until the latter half of the seventeenth century; yet in the tariff of Wittenburg of 1646, *Catechu seu terra Japonica* is met with. It again occurs in several other tariffs of the same century, and is always quoted at very high prices. In 1666, at Magdeburg, catechu was much more costly than benzoin, balsam of Peru, camphor, opium, mastix, etc. ("Documente," p. 64). Even in 1780 the wholesale price in London was £20 per cwt.; to-day the commodity fetches about 18s.

The earliest mention of Cinchona bark—*China Chinæ*—is found in the tariffs of Leipzig and Frankfurt of the year 1669. In England it had begun to be known about 1655.

One of the most curious things is the occurrence of coals, *carbones petræ*, among the drugs of the tariff of the city of Freiberg, in Saxony, A.D. 1680.

Cacao seeds and chocolate were to be found with German pharmacutists as early as 1656 and 1683 ("Documente," pp. 53 and 69), and *Coffee*—"Bon Coffi Grana"—in 1683 in the pharmaceutical office of the court of Dresden. It is much more striking to learn from the tariff of the city of Nordhausen, near Göttingen, that in 1657—*Herba theæ*—was there a pharmaceutical article. It also occurs in the tariff of Liegnitz, in Silesia, in 1662, under its Chinese name, *Herba shak*; it then commanded a most extraordinary price, namely, fifteen florins a handful.

Gamboge.—I have afforded some new information about the history of that drug, as may be seen in the "Documente," pp. 41, 43, 44, 46, 48, etc. In the list of Frankfurt, of 1612, *Gutta gemou* (gamboge) is stated to be a purging dried juice, coming from the kingdom of Patana in India. The meaning of *Gutta gemou* is explained in the "Pharmacographia," p. 77. Patana is a country and a port on the eastern coast of the peninsula of Malacca, where the Dutch established a settlement in 1602, and were followed there in 1612 by the English. Gamboge may have been imported there from the countries on the opposite shore of Cambodja, where it is still collected.¹ Its early introduction in Europe is, no doubt, due to the Dutch. In the tariff of Copenhagen of 1619, and in many tariffs of German towns down to the eighteenth century, gamboge is also termed Gummi de Peru, which is, no doubt, simply a corruption of the Javanese word gemou, or jamu—i. e., a medicine ("Pharmacographia," p. 77, note 4).

Iris Florentina.—As may be seen even in the "Divina Commedia," cant. xvi, the ancient arms of Florence were a white iris on a red shield, which were subsequently altered, the red iris or lily (*giaggiolo*) now being on a white shield. This probably indicates an early cultivation of orris root near Florence. In the early ages, that of Illyria was held to be the best ("Pharmacographia," p. 599), and was still quoted in many of the German lists under notice. In that of Schweinfurt, in 1614, *Radix Iridis Florentinæ*, however, is the only one mentioned.

Liquorice.—A list published in 1582 at Frankfurt informs us that they had then Russian and Spanish liquorice and inspissated liquorice

¹ See *Pharm. Journ.*, iv. (1874), p. 803.

juice from Candia. In many other tariffs—for instance, in that of Worms, 1609, and in that of Copenhagen, 1619—liquorice of Bamberg in Bavaria is quoted, and in Conrad Gesner's interesting work, "De Hortis Germaniæ," Strassburg, 1561, p. 164, the author says already that near Bamberg of liquorice there was "*maximus eius proventus*."

Manna of Briangon, from *Pinus larix*, "Pharmacographia," p. 373, would appear ("Documente," pp. 18 and 30) not to have been so very rare an article in the second half of the sixteenth century as it is now-a-days.

Mastiche.—From the very exhaustive information on the history of mastiche alluded to in the "Pharmacographia," I was led to suppose that resin to have always exclusively been produced in the island of Scio (Chios), but there is evidence ("Documente," pp. 31, 41 and 65) that it was also collected in the island of Cyprus.

Mucunae setæ—cowhage.—The pods and hairs of *Mucuna pruriens* were not much used in England before 1769 ("Pharmacographia," p. 166); they appear, however, to have been employed as early as 1714 in Germany, inasmuch as they are contained in the list of Onolzbach, near Nürnberg ("Documente," p. 84).

Among essential oils that of *bergamot* is well worth noticing in the "Catalogus omnium medicamentorum . . . in officina pharmaceutica & J. C. Scipione . . ." This is the private list of a druggist of Giessen, 1688. There are several lists recorded in my "Documente" which had been published in the seventeenth century by German pharmacists in order to show what stores they offered for sale; no doubt this was the case with only the most considerable pharmaceutical establishments of the time. The earliest notice of oil of bergamot pointed out in the "Pharmacographia," p. 109, referred to the year 1693, when it was mentioned in "Le Parfumeur François." The "Documente" now trace it a few years further back.

Oleum cajuputi was to be met in the little town of Hof, east of Coburg, as early as 1726, a fact which also is no longer in full accordance with the statements of the "Pharmacographia."

Oleum Matricariæ Chamomillæ.—This oil, which is so extremely remarkable on account of its intensely blue tint, had apparently never been appreciated in England. In Germany it was prepared in 1588

by Joachim Camerarius; and was to be found in 1608 in the "Apotheke" of the city of Schweinfurt.

One of the most costly oils used to be that of cinnamon; it was even quoted at a higher rate than otto of rose. The latter was a regular article of pharmacy in Germany as far back as the year 1607, when it was enumerated in the list of Freiburg.

The oils of sassafras and of cochlearia were sold at Dresden in 1683. Crystallized oil of sassafras appears to have been first obtained by John Maud, F.R.S., in 1738. He stated the crystals to be as long as four inches; I have prepared colorless crystals exceeding that length and more than one inch in diameter.

Piper æthiopicum, or *Piper nigrorum*, one of the substitutes for pepper, occurs in the lists of Wittenberg, 1646, Nordhausen, 1657, Magdeburg, 1666. This spice consisted of the fruit bunches of a tree of the order *Anonaceæ*, indigenous throughout Western tropical Africa—viz., *Xylopia æthiopica*, Richard (*Syn. Habzelia æth.*, D. C.; *Unona*, Duval; *Uvaria*, Guill. et Perrott.). It is figured in Matthioli's "Commentar. in sex libr. Diosc.," Venetiis, 1570, fol. 400; also in Guibourt's "Hist. nat. des Drogues simples," III (1869), p. 736, and described in Lindley's "Flora Medica," p. 27, as well as in Oliver's "Flora of Tropical Africa," I (1868), p. 30. Nothing whatever is known about the chemical constituents of this fruit, which is now entirely out of use.

Saffron.—English saffron has been so abundantly exported in the seventeenth century that it is found in the tariff of Copenhagen in 1619, and is even termed in that of Celle, in Hanover, 1682, *Crocus communis Anglicus*. This agrees well with our statements in the "Pharmacographia," p. 603.

Sarsaparilla was known in England about the year 1568; it appears to have been sold in Frankfurt in 1582.

Sassafras was sent to England in the beginning of the seventeenth century, as may be supposed from the facts recorded in the "Pharmacographia," p. 483. The drug was well known at Frankfurt in 1582, and at Hamburg in 1587, when it was termed *Lignum pavamum*, s. *floridum*, s. *xylomarathri* (fennel-wood).

Serpentary root of Virginia is met with in 1697 ("Documente," p. 77); in England it was in regular use at least since the year 1650.

Sugar.—Some interesting contributions to its history may be derived from the "Documente," p. 32. There were in the sixteenth and seventeenth centuries many sorts and kinds of sugar illustrating the migration of the sugar cane from India to the new world. Thus, *Saccharum candum*, or also sometimes, *Sal indum*, is sugar of Indian origin; *Saccharum tabarzeth* means in Persian a very hard crystallized sugar; *Saccharum Melitense* alludes to Malta; whereas, strange enough, neither Egyptian nor Sicilian sugar is ever mentioned in the tariffs. From the Mediterranean the plant was introduced into the Atlantic islands—hence *Saccharum Madeirense*, *Canariense*, and at last sugar from the island of San Tome, in the Gulf of Guinea, *Saccharum Thomasinum*. In this place the sweet cane had been transplanted by the Portuguese about the year 1500, but in a later period they stopped its cultivation in the island in favor of its introduction into Brazil. All these various kinds of sugar are mentioned in the German lists under examination; and besides them there is frequently to be met with *Saccharum penidium*, or *Saccharum turbinatum*, the preparations now known under the names of boiled or pulled sugar, the amorphous barley sugar of the confectioners.

Zinc seu Spiautr is an article of the tariff of Copenhagen of 1672; in a German list of 1682 it is distinguished as *Marchasita pallida v. Zinck* from *Marchasita officinarum*, *plumbum cinereum*—i. e., bismut.

The "Documente," if I am correct, afford a very curious illustration of the state of pharmacy, especially in Germany, during the sixteenth and seventeenth centuries, as the above abstracts from my pamphlet may prove. They, at the same time, furnish many little contributions to the history of drugs, and are the more remarkable as similar documents—at least, in so great a number and variety—seem not to exist in any other country than in Germany, and perhaps a few other countries where the German idiom is spoken. I thought them well deserving of a somewhat minute investigation, inasmuch as they must be considered as a real picture of ancient times, full of actuality.—*Phar. Jour. and Trans.*, 1876. June 24.

NOTES ON THE INTERNATIONAL EXPOSITION.

BY THE EDITOR.

III.

In addition to the notes on the cinchonas and their products, published in our last number, the exhibit of Evans, Lescher & Evans, of Liverpool, England, deserves to be mentioned for the specimens of South American red bark and of the East Indian barks of *Cinchona lancifolia* and *C. succirubra* in connection with fluid extracts, and some salts of cinchona alkaloids. Cinchona barks are also found in the department of Venezuela, in the Agricultural Building; the kinds shown are those known by the local names of *carayaca* and *barquisimeto*, the botanical origin of which we have not ascertained, and the bark of *Cinch. cordifolia* var. *rotundifolia*, Weddell. This tree is indigenous to New Grenada, attains a height of 23 to 26 feet and grows at an elevation of 5,000 to 8,000 feet (1,500 to 2,400 metres) above the sea. Several varieties of this species are found further South in Peru; the variety *rotundifolia* was discovered not far from Caracas by Dr. Ernst, in 1870, after it had been collected by Dr. Vargas, in the same place, in 1829 (see "Am. Jour. Pharm.," 1870, p. 449). Delondre and Bouchardat obtained from this bark 1.2 to 1.4 per cent. of quinia sulphate containing some quinidia, and .5 to .6 per cent. of cinchonina sulphate. Marciano found much less in the bark from Caracas, probably in consequence of improper collection.

The mother liquors finally obtained in the manufacture of the cinchona alkaloids contain the uncrystallizable chinoidin, which is also found in our commerce under the names of amorphous quinia and precipitated extract of bark. Notwithstanding it has been repeatedly and urgently recommended as a reliable tonic and efficient febrifuge, it is comparatively little employed in regular practice, a neglect which, in our opinion, is not at all deserved, but may, perhaps, be traced to its unsightly resinous appearance and its difficult manageableness, owing to its insolubility in water. These objections are entirely removed by a compound exhibited by Fr. Jobst, namely, the *citrate of chinoidin*, in the form of transparent scales, resembling the scale preparations of iron. In this combination chinoidin may be readily given in any desired form, and, therefore, as conveniently prescribed as any salt of the more costly cinchona alkaloids. We think that pharmacists should direct the attention of physicians to this new and handsome preparation.

Another febrifuge drug which has attracted some attention since the Vienna International Exposition is *dita bark*, the bark of *Ecbites scholaris* Lin., s. *Alstonia scholaris*, R. Br., which is exhibited by Jac. Zobel, apothecary at Manilla, under the names of *Cortexa de dita* or *quina Filipina*. Gruppe had prepared from it an amorphous alkaloid called *ditaina* ("Am. Jour. Pharm.," 1873, p. 316), which was found to possess several advantages, even over quinia in the treatment of fevers. This ditaina is evidently not a pure alkaloid, and the peculiar proximate principles of dita bark are more numerous ("Am. Jour. Pharm.," 1873, p. 221) than was at first supposed. Jobst and Hesse obtained from the alcoholic tincture, by precipitating it with sugar of lead, a crystalline and an oily acid; by precipitating afterwards with subacetate of lead, different resin-like products, and subsequently, by

- acidulating and treating with phospho-tungstic acid, an alkaloid (.02 per cent. of the bark) called *ditamina*, which yields crystallizable and very bitter salts. By treating the bark directly with petroleum benzin, several principles were obtained, of which *echicauchin*, *echicerin* and *echiretin* appear to be compounds of O_2 with respectively 5, 6 and 7 molecules of C_8H_8 , while *echitin* was found to have the composition $C_{31}H_{53}O_3$, *echitein* being $C_{42}H_{70}O_2$. The last named two principles, handsomely crystallized, are exhibited by Fr. Jobst, together with echicerin. Jobst and Hesse, however, are of the opinion that the febrifuge properties of dita bark, if really as powerful and reliable as has been asserted, can hardly be due solely to the minute quantity of alkaloid contained in it, and that, therefore, the bark promises to be of little importance as the source of well characterized alkaloidal salts ("Ann. Chem. u. Phar.," vol. 178).

It may not be uninteresting to mention, in this connection, that several other species of *Echites* are medicinally employed in the East Indies, as *Ech. malabarica*, Lam., the root of which is used as a febrifuge and the leaves as an application to carbuncles; *Ech. caryophyllata*, Roxb., the leaves used in arthritic fevers; *Ech. pubescens*, Buch. and *Ech. antidysenterica*, Roxb., the bark used as a remedy for diarrhoea and dysentery. Several Brazilian species, like *Ech. Cururu*, Mart., *Ech. insignis*, Spr. and *Ech. longiflora*, Desf., are used there for similar affections of the bowels, and *Ech. syphilitica* Lin. fil., indigenous to Surinam, is employed there in syphilitic complaints. It is not unlikely that all species of this genus, perhaps all the plants of the natural order Apocynaceæ, possess valuable medicinal properties to a greater or less degree.

By far greater importance must be attributed to a native tree of Australia, *Eucalyptus globulus*, which, during the last six or eight years, has attracted a great deal of attention in various parts of the world, on account of its reputed anti-malarial and febrifuge properties (see "Am. Jour. Pharm.," 1869, p. 300; 1872, pp. 219, 540, 564; 1873, pp. 233, 281; 1874, p. 41; 1875, p. 423; 1876, pp. 23, 329). It is now extensively cultivated in Southern Europe and Northern Africa, throughout a large part of the basin of the Mediterranean, nearly all the States of that section having sent the leaves and volatile oil to the exposition; some also other pharmaceutical preparations, like distilled water and spirit, tincture, wine, extract, resin, &c. The Orange Free State of Southern Africa sends a section of wood, and from American countries *Eucalyptus* leaves are exhibited by Brazil, Mexico, Jamaica and the United States. In Jamaica, where the plant has been introduced in 1870 and raised from seed, has attained a height of fifty feet in five years; it is at present grown at an elevation of 5,000 feet above the sea, and the fresh leaves have yielded the same amount of volatile oil as in Australia, about 75 per cent., some of which is exhibited by Mr. Rob. Thomson, also some wood, the tree being regarded as very valuable for timber. During the last two years the tree has become popular in a few localities of South Carolina, and more recently it has been planted in North Carolina, promising well in both localities. To study the various species of *Eucalyptus*, however, more particularly in relation to their wood and natural exudations, no portion of the exposition offers better opportunities than the native country of these myrtles, Australia.

The province of Queensland exhibits several large collections of its valuable

timber, in the form of logs and slabs, partly polished so as to show their grain to better advantage, and among them are not less than thirty distinct species of myrtles, belonging to *Myrtus*, *Melaleuca*, *Eugenia*, *Eucalyptus* and other genera. Similar exhibits are made by Tasmania, Victoria and other Australian colonies, and altogether we have noticed timber from over thirty different species of *Eucalyptus*, the wood of which varies between a light yellow or brown, some varieties having a distinct green tint, to a dark brown, red-brown or brownish red, the albumen being in all cases of a lighter color, and the duramen, or heart wood, frequently veined or of a marbled appearance. The vernacular names of blood-wood (*Euc. corymbosa*, Sm.), mahogany (*Euc. marginata* and *resinifera*, Smith), yellow box (*Euc. hemiphloia*, Muell., and *melliodora*, Cunn.), and others have reference to the color of the wood; the name *mahogany* is, however, given in Australia to several other myrtles, and probably to trees of other natural orders having red-colored wood. The green timber of the Eucalypts is stated to be generally soft, and to acquire its hardness on drying, many varieties becoming then difficult to work.

It is, however, not the value of these woods for the builder or cabinet maker that gives to them their medicinal and pharmaceutical importance, but rather the so-called gums and the volatile oils which the various species yield, some in very large quantities. The so-called Botany bay kino is the product obtained by inspissating the red exudation of *Euc. resinifera*, Sm.; but similar products are obtained from other species, like *Euc. corymbosa*, Sm., *E. maculata*, Hook., *E. rostrata*, Schlecht., *E. hemiphloia*, Muell., *E. siderophloia*, Benth. and others, and are exhibited in the colonial departments of Australia. The "gum" of the last named species is shown in irregular lumps, and likewise in thin transparent garnet-red scales, resembling the scale preparations of iron. The majority of these products appear to be closely allied to the pterocarpus kino; according to Wiesner ("Zeitschr. Oest. Apoth. Ver.," 1871), who examined the exudation from 16 eucalypts obtained from Dr. Moore, director of the Botanical Garden at Sidney, they contain kinotannic, and small quantities of catechuic and pyrocatechuic acids, but are free from pectin compounds. Some of these varieties were entirely free from gum, while others were found to contain small, and a few large quantities of gum; the latter is particularly the case with the "gum" from *Euc. gigantea*, Hook., which is almost completely insoluble in alcohol.

The separation of a saccharine substance upon the leaves and tender twigs of some eucalypts has been noticed some years ago ("Am. Jour. Pharm.," 1862, p. 546). This Australian *manna* appears to be of two kinds, that which is exuded by *Euc. viminalis*, Labill., as is supposed in consequence of the punctures of insects, and the kind called *lerp*, which is regarded as the secretion of an insect of the *Psylla* family upon the leaves of the mallee scrub, the *Euc. dumosa*, Cunn. Both kinds appear not to contain any mannit.

The importance of the eucalypts as sources for an almost unlimited supply of volatile oils of various kinds, has been noticed on former occasions ("Am. Jour. Pharm.," 1863, p. 451), and, we believe, first attracted attention through the observations of Baron F. von Mueller, director of the Botanical Garden at Melbourne,

to whom, likewise, the credit is due of having proven the very rapid development, even on dry and exposed spots, of *Euc. globulus*, Labill., *Euc. obliqua*, L'Herit., and other Australian trees ("Am. Jour. Pharm.," 1868, p. 51), upon which quality the malaria-destroying properties of the blue gum tree (*Euc. globulus*) appear to depend. It is, however, not unlikely that the presence of a large proportion of volatile oil may be quite an important factor in this respect.

Volatile oils are found in all the eucalypts, whether they merely attain the moderate size of shrubs, like the mallee scrub (*Euc. dumosa*, Cunn., *E. oleosa* and *socialis*, Muel.), or rise as towering giants to the height of 400 or 500 feet, like the *Euc. colosseae*, Muel., and *Euc. amygdalina*, Labill. The vast amount of volatile oil produced by the Australian eucalypts has been well set forth in a paper read by Mr. Jos. Bosisto, President of the Pharmaceutical Society of Victoria, before the Royal Society of Victoria, August 10, 1874, from which we make the following abstract :

The eucalypts agree in this, that they cast their bark ; that the leaves are ever-green and have translucent oil cells ; that the petiole is half twisted and the plane of the leaf parallel to the axis of the tree ; that the roots are dispersive and drain water largely from the soil, and that they contain tannin (tannate gum resin), volatile acid and volatile oil. Most parts of the tree contain the two first mentioned principles, but the oil is found only in the leaves. Regarding the quantity of the volatile oil yielded by the eucalypts, the following 8 out of 130 species enumerated by Baron Mueller are regarded as representative, and 1,000 lbs. of their fresh leaves (attached to very small branches) yield the quantities of volatile oil stated below :

1 <i>Euc. odorata</i> , Behr, or peppermint tree,	yield	7 fluidounces	volatile oil.
2 <i>Euc. viminalis</i> , Labill., or manna gum,	"	7	" "
3 <i>Euc. rostrata</i> , Schlech., or red gum,	"	15	" "
4 <i>Euc. obliqua</i> , L'Her., or stringy bark,	"	80	" "
5 <i>Euc. globulus</i> , Labill., or blue gum,	"	120	" "
6 <i>Euc. sideroxylon</i> , Bent., or iron bark,	"	160	" "
7 <i>Euc. oleosa</i> , Muel., or mallee,	"	200	" "
8 <i>Euc. amygdalina</i> , Labill., or peppermint tree,	"	500	" "

The range of the species represented by the first two is limited, while the others have a wide range. The supply of oil varies, the variation, however, does not arise from any diminution of leaves, nor does it follow in a cycle of time from maximum to minimum, but it is intermittent. The full causes of these peculiarities are not known ; but some are pointed out as follows :

Euc. amygdalina, which varies in size from that of an ordinary willow to over 350 feet in height, occupies chiefly the higher portions of undulating forest lands and the sides of the ranges, and does not extend over 100 miles inland ; the ground where it grows retains a little moisture throughout the summer months, September to April, the roots run chiefly lateral and are seldom lower than three feet from the surface ; they are surrounded with a soil evenly cool, but the temperature of the air has its usual summer range, and during these months the supply of oil from week to week is very even ; but as the cooler or winter months approach, the

ground becoming moist from rain, and the temperature of the air lower, the supply of oil falls off.

The mallee scrub is the opposite of all this. These dwarfs of the eucalypts seldom grow higher than 25 feet, and occupy a flat, dry, hungry country, with but little growth of grass under them, chiefly dwarf heath bushes. There is little rain, but when it comes it is generally in torrents; the soil is a reddish sand, in combination with salt clay; this, during the long droughts, becomes exceedingly hard, so much so that a pickaxe is required to turn the soil. The rootlets run somewhat in a horizontal direction, but the rootlets spread traveling downward; and, as the salt water is to be obtained always at from 25 to 40 feet, they are found resting on the moisture of the salt soil, just above the sandstone rock, which generally commences about 12 feet above the salt spring. The temperature of the surface ground, and also that of the air, is very high throughout the summer. The leaves supply a greater amount of oil during the winter or rainy months than during the hot summer months.

These circumstances depend partly upon the development of new leaves, which in the desert species commences in summer (December and January), but in the *amygdalina*, *globulus* and others in winter (July and August). Moreover, the vigor of the eucalypts is greater in some years than others, and when little new growth takes place the oil-cells are charged more equally throughout the whole year.

To illustrate further: In July, 1872, the ground being well saturated with moisture, the mallee was in fine oil condition, each two tons of rough-cut branches with their leaves gave two (Imperial) gallons of oil. The dry season set in immediately after, the temperature of the air rose rapidly to summer heat, ranging between 68 and 92° F., and in November the country was greatly parched and the only water obtainable was from the river Murray. The yield of oil decreased in November to 14 pints, in the beginning of December to 12, by the end of the year to 9 pints, and by the end of summer (March) fluctuated between 8 and 4 pints. During the same winter (July), the *amygdalina* yielded only one-fifth of its full summer supply. The variations during the two preceding years were similar, but not as rapid, while in 1861 the mallee yielded as much volatile oil in December as in July 1872, and the coast species kept up a good supply, with little change, throughout the whole year.

The volatile acid is contained more abundantly in those eucalypts which yield medium quantities of oil than in those yielding oils either largely or sparingly. In like manner this applies to the resin bodies. In the *amygdalina*, when the gum-resin begins to form and exude, the oil in the leaves is diminished. When the *globulus* is extra resiniferous, the acid is abundant and the oil small in quantity. The *rostrata* produces little oil, but the volatile acid is very abundant, so that the red gum wood owes its aroma entirely to this acid. The *sideroxylon* supplies oil abundantly, but the leaf surface is small in comparison with other species, and the enormous bark is everywhere studded with gum resin.

All these characteristics point to the conclusion that the volatile oil is the base of the other eucalyptic products.

The amount of oil produced by the eucalypts of Victoria and contained in their leaves is estimated as follows :

	Area.	Average yield of one gallon of oil for every	Total yield of volatile oil.
Dense mallee scrub,	5,560,000 acres.	50 square ft.	4,843,872,000 gallons.
Mountainous ranges, densely wooded with gums,	6,225,000 "	1000 "	271,161,000 "
Open timbered country,	38,922,000 "	4 acres.	9,730,000 "

Estimating the extent of the Mallee country in New South Wales and South Australia at twenty times the area given above, there are 96,877,444,000 galls. of oil held at one and the same time in a belt of country massed together, over which the hot winds pass ; and considering that the same condition exists throughout the major part of Australia with the other eucalypts, we cannot arrive at any other conclusion than that the whole atmosphere of Australia is more or less affected by the perpetual exhalation of these volatile bodies and the generation of ozone by the minutely divided volatile oil.

All the physical and chemical characters of the eucalypts, enumerated above, lead to the conclusion that they are fever-destroying trees.

An interesting collection of eucalyptus products, which, after the close of the exhibition, will be presented to the Philadelphia College of Pharmacy, together with the other products sent here by Mr. Bosisto, comprise, besides a number of essential oils, also some pharmaceutical and technical products. The essential oils are those of blue gum (*E. globulus*), peppermint gum (*E. amygdalina*), mallee scrub (*E. oleosa*), red gum (*E. rostrata*), ironbark gum (*E. sideroxylon*), peach gum (*E. persicifolia*), sweet-scented gum of Queensland (*E. citriodora*), messmate gum (*E. fissilis*), apple tree gum (*E. stuartiana*), and white gum (*E. gonicalyx*). They vary considerably in their odor, which is for some, indicated by the vernacular names. Thus the oils of the various peppermint gums have an odor reminding of mint, the peach gum oil, one reminding of bitter almond, etc.

The blue gum is named from the shade of its foliage. The volatile oil is regarded as tonic, stimulant, antiseptic and anthelmintic ; a small dose promotes the appetite, a large one destroys it. In doses of 10 to 20 minims it first accelerates the pulse and produces pleasant general excitement, shown by irresistible desire for moving about, and a feeling of buoyancy and strength. It is intoxicating in very large doses, not followed by torpor, but producing a general calmness and soothing sleep ; any unpleasantness arising from an overdose will be removed by a cup of strong coffee. Internally it is given in doses of 3 to 5 minims in mucilage, syrup or glycerin, and as an anthelmintic by enema in quantities of 30 to 60 minims in mucilage of starch. The portion of the volatile oil called *eucalyptol*, ("Amer. Jour. Phar." 1870, p. 465), which, according to Faust and Homeyer, (*Ibid.* 1875, p. 65), is a mixture of four different compounds, is employed for inhalation in bronchial and throat affections, one-half to one teaspoonful being added to half a pint of water in the inhaler.

The powdered leaves of *Euc. globulus* are employed as an antiseptic cataplasm, and the tincture and a liquor as general tonics in doses of 20 to 30 minims, and as antiperiodics in double this quantity ; cigarettes made of the leaves have been recommended in bronchial and asthmatic affections.

The oil of *Euc. amygdalina* is used externally in rheumatic complaints, and in perfumery, for soaps, etc. Dr. Day, of Geelong, recommends as an excellent and very agreeable disinfectant, deal saw-dust mixed in the proportion of one bushel with about one to four ounces of the volatile oil; after keeping the mixture for four months, he found it to contain a much larger quantity of peroxide of hydrogen, than it did when first made, and that it continued to accumulate.

The oil of *Euc. oleosa* is chiefly employed in the manufacture of varnishes, which are said to be much superior than if oil of turpentine be used; the oil dissolves India rubber without requiring the application of heat.

The "red gum" of *Euc. rostrata* is stated by Mr. Bosisto to be a delicate mucilagenous astringent, more effective than catechu in all cases of dysentery, diarrhoea and throat affections. The sample examined by Wiesner (see above) was readily soluble in water and alcohol, free from gum, and had a neutral reaction.

Pharmaceutical preparations of *Euc. globulus* are also exhibited from Egypt, France and other countries, and if the importance is considered which this species has attained in many localities within a comparatively short period, it seems that experiments should be made with it in all sections of the United States which are free from severe frosts, and that these experiments should not be confined to that single species, but should also be extended to others which are equally rapid growers or produce the same or larger quantities of volatile oils.

ANILIN COLORS.

BY CARL RUMPF.¹

By dry distillation (without access of air) of coal, two accessory products are principally formed—coke and tar. The ammoniacal waters which are obtained have recently been largely used for the manufacturing of ammonia and its different salts. Coal tar forms the starting point for all the anilin colors, and also for alizarin. By heating it in cast-iron retorts up to a temperature of 180°C., there result successively *benzol*, *toluol*, *cumol* and *xylol*. The two last, as likewise a few other hydrocarbons, afford only a scientific interest. By nitrifying, *i. e.*, treating the two first-named fluids with strong nitric acid at a low temperature, *nitro-benzol*, best adapted for red or for blue anilin, and *nitro-toluol*, are produced. By employing more acid at a higher temperature binitro-benzol and binitro-toluol are formed. The conveying of these nitro-compounds into the amido-compounds, *viz.*, *anilin oil for red anilin*, *anilin oil for blue anilin*, and *toluidin*, is effected by agitating them for a time with acetic acid and iron borings, in the proportion of about equal weights, and then separating, through distillation, the anilin or toluidin from the excess of iron borings. According to a report delivered by Koechlin to the Parisian Academy, the honor of the discovery of anilin red, or fuchsin, is due to Prof. A. W. Hofmann, formerly

¹ This paper gives a succinct amount of the manufacture of anilin and allied colors from coal tar, and is condensed from a pamphlet issued by Fr. Bayer & Co., of Barmen and Elberfeld, in explanation of their interesting collection of crude materials and the products obtained therefrom, which are now on exhibition in Fairmount Park. Another paper on "Alizarin" will follow in our next number.—EDITOR
Am. Jour. Phar.

of London, now at Berlin, who, in 1857, first described the effect of tetrachloride of carbon on anilin. By continued experiments, other chemists succeeded in perfecting this process (which was not adapted for gaining large quantities of this coloring matter), by finding in place of chloride of carbon the proto- and per-nitrate of mercury, and finally the most advantageous substitute—arsenic acid.

Prof. Hofmann, by farther investigations, discovered that chemically pure anilin as well as chemically pure toluidin do not produce any red dye in a workable manner, but that, very peculiarly, a mixture of both does. The proper proportion of the mixture, 1 part of anilin to 2 parts of toluidin, is sought to be attained as near as possible in the technical process for manufacturing the fuchsin. The first who obtained a patent for the production of anilin red with arsenic acid was Metlok, an English chemist. The best and most practical method is the following :

A mixture of anilin oil for red and arsenic acid, diluted with water, is heated in a distilling apparatus from 10 to 12 hours at a temperature of 180° to 190°C. The fused mass obtained in this way is broken into small pieces, boiled out with water the undecomposed arsenic acid as well as the arsenious acid which is formed is neutralized with chalk, and immediately after the color is dissolved the liquor is filtered through felt into the crystallization vessels. After three or four days cooling, the crystallization of the fuchsin has taken place, and the mother liquor is let off. The crystals, dried and freed from all dust and all the small crystals, represent *diamond fuchsin large crystals*, the smaller crystals passed through a sieve *diamond fuchsin small crystals*, and the uncrystallized part at the bottom of the crystallization tub is called *fuchsin red (ordinary)*.

The basis of this peculiar dye, produced as above, Prof. Hofmann has called *roseanilin* (rosein base), a name now generally adopted. The combination of this base with any acid furnishes a number of salts; for instance, with acetic acid *acetate of roseanilin*. The oxalate, sulphate and nitrate of roseanilin are of little importance for dyeing. For the production of the pure base, the common acetate of roseanilin is used with the most advantage. The boiling solution, by adding an excess of ammonia, furnishes a crystalline sediment of a red color, which represents the base in a tolerable pure state.

About the year 1856, Perkins, in England, being occupied with experiments to produce quinia artificially, accidentally discovered a violet color, which, having been improved by several chemists, was for a long time known in the market under the name of Perkins' Violet, Anilin purple, Phenamin, Indisin, etc.

After red and violet had thus been discovered and practically employed, endeavors were generally made for producing an anilin blue, to which exertions and experiments the different violets as, *violet reddish*, *violet medium shade* (Pensée) and *violet blueish* (Parme), all three soluble in alcohol, owe their origin, as the following method shows :

By heating a mixture of fuchsin and anilin oil (an addition of acetate of soda facilitates the reaction) five to eight hours at a temperature of 150° to 160°C., the red color of the compound is gradually changed into violet. According to the desired shade, the fused mass is treated with acidulated water, the residue filtered and dried, and so the above blueish-violets are obtained.

The case is different with regard to blue. If 1 part of fuchsin, 3 to 4 parts of anilin oil and 1 part of acetate of soda are heated as above, the blue color is formed. By this process three equivalents of phenyl are taken up by the fuchsin, forming triphenyl roseanilin and ammonia, which is given off. Of course, only the pure anilin is used. The fused mass treated with concentrated muriatic acid, and afterwards, according to the more greenish or reddish shade which is wanted, with alcohol, furnishes the *blue colors soluble in alcohol*, namely, blue reddish shade (Bleu de Lyons) and night blue, or Bleu de lumière.

A great obstacle against a larger consumption of these blues, however, was their insolubility in water.

Many experiments for their transformation, at last led to a treatment analogous to the formation of the sulphate of indigo, and the success was a brilliant one, by the following method: 1 part blue, soluble in alcohol, is dissolved in 5 to 6 parts of common 66° sulphuric acid; the solution is heated to a temperature of 130° to 140°C., then the acid is neutralized with soda or potash, and the precipitate filtered and dried. The sulphuric acid enters by this process into the blue, and forms anilin blue-sulphuric acid.

According to the more reddish or greenish shade of anilin blue, soluble in alcohol, which is converted, the products differ in shade, and furnish the anilin blues soluble in water: blue reddish shade (Bleu de Lyons), pure blue blueish, pure blue greenish and night blue, or bleu de lumière.

If, instead of soda, lime salts are used for the neutralization of the sulphuric acid, the blues retain nearly the same shades, but acquire the property of *dyeing more easily on cotton and silk*.

The blues soluble in water mentioned so far, contain at least two equivalents of sulphuric acid (SO_4). If the sulpho blue solution is heated only to 30° to 40°C., and then neutralized with soda or caustic lye, the monosulpho salt or *alkali blue* is produced, the shades of which are distinguished by the affixes I B to V B.

The newest product in this branch, *diphenylamin blue*, is distinguished by its pure greenish tone from all other anilin blues. It results by oxalic acid being heated with *diphenylamin*, which furnishes the first product, *diphenylamin blue, soluble in alcohol*, the transformation of which into the *diphenylamin blue, soluble in water*, is effected in the same manner as above mentioned about the other anilin blues.

Through farther investigations, by the action of iodide of methyl or iodide of ethyl on roseanilin, Prof. Hofmann discovered new violets, named after himself *Hofmann Violets*, and shortly afterwards the second important product in this direction, viz., the *iodine green*.

These Hofmann Violets, on account of the so far unattained beauty and brilliancy of their color, ruled the market completely for some years in all primrose or primula (purple) hues, until by another step in advance they were again improved and surpassed in the following manner: Muriate of anilin in crystals, when mixed with anilin oil and woodnaphtha (pyrolignous spirit), and exposed to a pressure of fifty atmospheres at a temperature of 250° to 300°C., is converted into dimethyl-anilin, from which, through a simple oxidation by the assistance of chlorate of potassa or chloride of copper, the *methyl violet* results.

Through further treatment with chloride of benzyl, produced by the action of chlorine gas on boiling toluol, the bluer shades are obtained, as, *methyl violet II B* to *V B*, and by treating them with iodine, the redder hues—*methyl violet, I R* to *V R*.

In a similar manner, as the iodine violets were supplanted by the methyl violets, the iodine green, formerly predominant, and besides the little-known Chinese indigo (Luh-Chao), the only color in existence for dyeing night-green shades, has been replaced by the *methyl greens*, which result, also as a second product, from the process of making methyl violets, and are produced with yellowish and blueish hues in crystals and in powder.

Muriate of anilin in cakes (generally called anilin salt, like the muriate of anilin in crystals) serves exclusively for the production of *anilin black*, which, when mixed with other mordants (chlorate of potassa, sulphate of copper, etc.) and gum or starch thickening, and printed on cotton through a process of oxidation, gives a black color hitherto unknown in equal fastness, and therefore has become of very great importance for all cotton print works.

By introducing nitrous acid into toluidin, and subsequent oxidation by means of bichromate of potassa, there is formed another valuable color—the *saffranin*.

Naphthalin, treated like benzol or toluol, as above mentioned, furnishes the nitro-naphthalin and naphthylamin, from the last of which, by the action of nitric acid, is produced the *Martius yellow*.

With the exception of this color, so far the naphthalin colors afforded little interest for industrial use. The possibility is, however, not excluded—in fact, it is very probable, as this hydrocarbon stands between benzol and anthracene—that in a short time we may be able to form still other naphthalin colors, which, standing between the madder and anilin colors, would unite the fastness of the former with the beauty of the latter.

Phenic acid, likewise produced by the distillation of coal tar, when treated with oxalic acid, gives *rosolic acid*, and this, under pressure with ammonia (NH_3), *corallin*.

The newest and most beautiful member of the family of these dyes is the *eosin* (Aurora). It is also a derivative from benzol, and obtained by introducing bromine into the *fluorescein* (very interesting for its play of colors), for the preparation of which phthalic acid and resorcin are employed.

The production of eosin is still in its infancy, but to judge from the results during the short time which has elapsed since its introduction, it promises to be of great importance in the future, as it not only fully supplies the place of the shades of rose-pink colors obtained with carmine of safflower, but surpasses them considerably in beauty.

The brown, known by the name of *vesuvin*, is a product of oxidation from nitrobenzol; it dyes all shades of Havana browns.

We conclude this division with the important product from carbolic acid, generally known as a yellow dye, the consumption of which is great, especially for all yellow tints on wool, and which has been introduced into the trade in two forms, both chemically pure—*picric acid* in crystals and in amorphous powder ($\text{C}_6\text{H}_3(\text{NO}_2)_3$).

VARIETIES.

ON ANTHRAFLAVON AND AN ACCESSORY PRODUCT OF THE MANUFACTURE OF ARTIFICIAL ALIZARIN. By M. A. Rosenstiehl.—The author showed in 1874 (*Comptes Rendus*, lxxix., p. 764) that the anthraflavon of Barth and Sennhofer, if melted with caustic potassa, gives simultaneous rise to two coloring matters, one of which, soluble in benzin and in alum water, dyes mordanted tissues shades bordering upon those of alizarin, whilst the other, insoluble in the same liquids, approaches purpurin; the shades obtained in dyeing are, in brightness and solidity, comparable to those of madder. The former of these colors is produced in such small quantities that its examination has not been hitherto possible. The latter is more plentiful, and is an isomer of purpurin approaching the isopurpurin or anthrapurpurin of Perkin. Anthraflavon itself is a mixture of two isomers of alizarin distinguished by their behavior with bases. The one forms a soda salt very soluble in water; it dissolves in baryta water, which it colors a deep orange yellow, combines with gelatinous alumina to form an orange lake, and if melted with caustic potash between 135° and 150° it forms the isomer of purpurin just mentioned. The other yields a soda salt sparingly soluble, and readily crystallisable; it is insoluble in cold baryta water, does not combine with gelatinous alumina, and if melted with potassa at the same temperature it does not give rise to a coloring matter; a little only is formed at a higher temperature, with the destruction of a large proportion of the substance. This second body can be obtained in the form of fine silky needles, which in bulk present the yellow color of chromate of lead, and recalls the aspect of chrysophanic acid. This body is identical with an accessory product of the manufacture of artificial alizarin from the works of Przibram & Co., of Praz.—*Chem. News*, July 14, 1876.

NEW COLOR.—Rosenstiehl has obtained a coloring matter in yellow metallic lamellæ by acting upon dry artificial alizarin with nitrous acid. With alumina it dyes yellow, and with iron mordants a red-violet, both of which colors can be brightened with boiling soap lyes. It dyes best in distilled water or with addition of acetate of lime. Rosenstiehl considers it as nitro-alizarin.—*Chem. News*, July 7th.

RESORCIN BLACK. By M. R. Wagner.—If to an aqueous solution of resorcin there is added sulphate of copper and then ammonia, enough to re-dissolve the precipitate first formed, a deep black liquid is obtained which dyes wool and silk black, and which may possibly be used as ink.—*Chem. News*, June 23, 1876.

MINUTES OF THE PHARMACEUTICAL MEETING.

A PHARMACEUTICAL MEETING was held July 18th, 1876, Edward Gaillard in the chair. Prof. Remington donated to the Cabinet from Cramer & Small, a stone jar in which balsam of tolu was imported a box which held 25 musk pods, and a sample of Persian opium.

E. M. Boring exhibited artificial oil of bitter almonds, made by Dr. F. Wilhelmi, Reudnitz, Leipsic, of which he is the inventor and only manufacturer. This substance is not to be confounded with mirbane oil, which merely smells like bitter almond oil, but it is identical as well in its composition as in its physical, chemical and physiological properties with the natural oil made from almonds, and has the great advantage over the natural oil that it is free from prussic acid, and is much cheaper.

C. W. Hancock exhibited re-sublined carbonate of ammonium as made by C. T. White & Co., which is without empyreumatic odor; also, solution of acetate of ammonium made with it, and pure acetic acid from the same firm. From long experience he finds it very grateful to the sick and much to be preferred over that made from ordinary commercial articles—a sample of which was likewise shown for comparison.

Prof. Bedford was asked as to the use of these materials in New York; he agreed with Mr. Hancock as to the advantage of the solution when thus prepared, but would confess that here, as there, the majority of apothecaries were not aware of these facts; he also said that ammonium carbonate was now made near New York of excellent quality, and that the English manufacturers were putting down the price to compete for the trade.

E. M. Boring, having tried the thick filtering paper spoken of at a former meeting, was not prepared to confirm all the statements made, and was corroborated by Dr. Pile who thought the ordinary round filtering paper much more serviceable.

Edward Gaillard found the solution of tartrate of sodium, as made by the formula of Mr. Hayhurst (*"Amer. Jour. Phar."*, p. 208), was too active a purgative, but when reduced to half the strength answered well. There is a demand for this preparation, and when properly labeled and sold, will give satisfaction.

Dr. Pile had examined a number of starches on exhibition, and advised the use of the microscope for this purpose. He found the globules of Jamaica arrow root to be of the same shape and size as those of a known sample of St. Vincent arrow root; while two samples of St. Vincent arrow root obtained from New York gave about three-quarters of Bermuda arrow root and one-fourth of tapioca farina, the globules of which are much smaller and rounded; other samples of St. Vincent arrow root, obtained in this city, were all right.

Adjourned to meet August 15th, 1876, at 3.30 P.M.

WILLIAM MCINTYRE, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

THE RHODE ISLAND PHARMACEUTICAL ASSOCIATION held its quarterly meeting July 10th, President Albert L. Calder in the chair.

The following members were elected delegates to the next meeting of the American Pharmaceutical Association: A. L. Calder, Charles Congdon, W. B. Blanding and W. F. Teston.

After the transaction of some routine and other business, the members with their ladies and invited guests dined at the Aquidneck House.

NEW YORK ALUMM ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.—The regular quarterly meeting was held on Tuesday, June 27th, in Plimpton Hall, and the attendance of members being small, was more of a social character. Some discussion was indulged in regarding Warburg's tincture, which has, of late, attracted much attention from the medical profession and press. A specimen of the tincture was presented made according to the original formula of Dr. Warburg, containing the *confectio damocratis* (?) which alone contains 48 different ingredients. After some further remarks, the meeting adjourned.

EDW. PLUMMER, *Secretary*.

THE PHARMACEUTICAL ASSOCIATION OF SOUTH CAROLINA, which was incorporated by act of the Legislature, approved by the Governor March 10th, 1876, was organized at Charleston, July 5th, when the following officers were elected for the ensuing year: President, G. J. Luhn, Charleston; Vice Presidents, E. H. Heinitsh, Columbia; W. C. McMillan, Marion; Secretary, C. G. Erckman, Charleston; Treasurer, Dr. H. Baer, Charleston; Pharmaceutical Examiners for Charleston—A. W. Eckel, Dr. E. H. Kellers, A. H. Schwacke, E. S. Burnham; Pharmaceutical Examiners for Columbia—C. H. Miot, E. H. Heinitsh, L. T. Silliman, W. C. McGregor.

The association, through the board of Examiners, has full power to license *pharmaceutists, apothecaries and druggists* within the State. Each of the two Boards, four members of which constitute a quorum, is constituted besides the gentlemen named above, of two other persons to be appointed respectively by the Medical College of the State of South Carolina (for Charleston), and by the Medical Faculty of the University of South Carolina (for Columbia). The Boards are elected to serve for one year.

EDITORIAL DEPARTMENT.

THE TWENTY-FOURTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION will be held at the Hall of the Philadelphia College of Pharmacy, commencing September 12th, at 3 o'clock P. M. The notice of the Permanent Secretary will be issued early in August, and give information in regard to the hotel accommodations provided for the visiting members. It is not unlikely that the hotels near the College building may then be well filled, since numerous conventions and society meetings will be held in Philadelphia about the same time. Ample accommodations, however, can be had within a convenient distance from the place

of meeting, with private families and in boarding houses, where full or partial board may be obtained; or rooms may be had without meals. For the convenience of those desiring such accommodations, a list will be kept at the College building, and may be consulted by all visiting members, between the hours of 9 A. M. and 6 P. M., when the Actuary of the College will be in attendance to give all desirable information to strangers, it being the desire of the College, that the building be used by its friends as a place of rendezvous while the Exhibition is in progress. Those members who are desirous to secure rooms in advance, may address the Permanent Secretary, stating full particulars.

The arrangements for visiting the Exposition are ample, there being communications by steam every few minutes between the centre of the city and the Exhibition Grounds. The Committee of Arrangements will, at the first session, submit a plan for visiting the Exposition, with the view of facilitating the examination of the numerous objects of interest, without conflicting with the business that may be brought before the Association.

INVITATION TO THE PHARMACISTS OF FOREIGN COUNTRIES.—The following invitation has been issued, in compliance with a resolution passed by the American Pharmaceutical Association at its twenty-third meeting. The invitation was sent to the general or prominent local pharmaceutical societies of the various countries, and has been brought to the notice of their members. From some acknowledgements received since, it is expected that a number of foreign pharmacists will make it convenient to visit this country at the time, and be present at the meeting of the National Association. The document referred to is as follows:

AMERICAN PHARMACEUTICAL ASSOCIATION,
Office of the Permanent Secretary,
PHILADELPHIA, May, 1876.

To the President of the —

HONORED SIR—The International Exposition has just been opened in the city of Philadelphia, and during its progress the American Pharmaceutical Association will hold its Twenty-fourth Annual Meeting in the same city, on the 12th day of September next. It is hoped that many pharmacutists and druggists of your State will embrace this opportunity to pay a visit to the United States, and we take great pleasure, on behalf of our Association, in cordially inviting them, through your honorable society, to so make their arrangements as to meet this Association at its next Annual Meeting.

It likewise affords us pleasure to inform you and the members of the society which you represent, that the Philadelphia College of Pharmacy has opened a bureau where information such as may be desired by strangers will be freely given to all visiting pharmacists and druggists daily, between the hours of 9 A. M. and 6 P. M.

Hoping to meet you and many colleagues of your country in September next, we have the honor to remain, dear sir,

With fraternal greeting,

GEORGE F. H. MARKOE,
Pharmacist in Boston, President Amer. Phar. Assoc.
JOHN M. MAISCH,
Permanent Secretary.

REVISION OF THE U. S. PHARMACOPŒIA.—The permanent Committee of the American Pharmaceutical Association has had this subject in consideration, and desires the co-operation of all pharmacists who are willing to contribute their experience or otherwise aid the committee; such communications, it is desired, should

reach Prof. P. W. Bedford, 10 Gold street, New York, before September 1st. The following circular embraces some suggestions relating to the next revision of the Pharmacopœia :

NEW YORK, May 15th, 1876.

To the Members of the Committee on Revision of the U. S. Pharmacopœia :

At the meeting of the committee held during the sessions of the Association in Boston, September, 1875, the undersigned were appointed a sub-committee to devise and prepare a plan of revision, which should be submitted for the guidance of the committee in their labors.

They respectfully report to the committee the following plan for the work of revision :

Each member of the committee should ask for the co-operation of the College of Pharmacy or Pharmaceutical Association which he represents in this committee, and secure their aid in the work of the committee.

Each member of the committee is requested to come prepared to discuss such modifications and changes in the U. S. Pharmacopœia, as may be deemed advisable by himself, or the Association he represents.

The committee are requested to meet on the morning of Wednesday, September 13th, at the call of the chairman, for such business as may be brought before the committee.

Your sub-committee recommend the following changes in the next edition of the Pharmacopœia, and suggest to the members of the committee, that whatever work be attempted before the meeting of the committee, be made to correspond to these recommendations :

- 1st.—That all measures of capacity be abandoned.
- 2d.—That all substances be weighed, and that the quantities be given in parts.
- 3d.—That all substances in the U. S. Pharmacopœia be arranged alphabetically.
- 4th.—That the botanical descriptions be made more exact and complete.
- 5th.—That the formula for the manufacture of chemicals which are recognized as produced entirely by manufacturing chemists be omitted, and that a description of the chemical be substituted with such tests as shall be conclusive as to its identity and purity.
- 6th.—That it is desirable that there should be a larger number of tables for reference introduced in the U. S. Pharmacopœia.

PAUL BALLUFF,
P. W. BEDFORD.

The chairman makes the following appointment of sub-committee :

Botany, Vegetable and Animal Materia Medica.

PROF. C. L. DIEHL, Chairman. PROF. G. F. H. MARKOE. PROF. W. T. WENTZELL.

Chemistry.

Pharmacy.

PROF. J. F. JUDGE, Chairman. PROF. P. W. BEDFORD, Chairman.
WILLIAM SAUNDERS, C. A. TUFTS,
A. E. EBERT. J. C. WHARTON.
PROF. J. FARIS MOORE, Chairman. W. S. THOMPSON, Chairman.
PAUL BALLUFF, C. H. DALRYMPLE,
A. B. TAYLOR. W. H. CRAWFORD.
P. W. BEDFORD, *Chairman.*
C. LEWIS DIEHL, *Secretary.*

OBJECTS OF HISTORICAL INTEREST AT THE CENTENNIAL EXPOSITION.—The Franklin Institute of Penna., has opened a reception room at the northwestern end of Machinery Hall, for the use of all interested in the mechanic arts. Besides files of the Journal of the Institute and other periodicals devoted to the industrial arts, which may be consulted by the visitors, the following objects of great historical interest, have been placed in the room :

1st. *Franklin's Electrical Machine.*—This instrument is doubtless the one used by the great philosopher in making his wonderful experiments in the science of electricity. Presented to the Institute by Dr. John R. Coxe.

2d. *Oliver Evans' Steam Locomotive Engine.*—This interesting model is among the earliest known, having been built about 1804.

3d. *Oliver Evans' High Pressure Steam Engine*.—This is the model of an engine built by O. Evans, about 1804, and is described in Galloway's work on the Steam Engine, page 101.—London, 1827.

4th. *Working Model of a Steam Engine* built by W. W. Baldwin, and presented by him to the Institute, about 1832.

OBITUARIES.

CHRISTIAN GOTTFRIED EHRENBERG, the celebrated naturalist, died at Berlin, Germany, June 28th, in his 82d year. He was born at Delitzsch, April 19th, 1795, and studied at first theology, afterwards medicine and natural science. In 1820 he accompanied General Minutoli to Egypt, returning from his oriental travels in 1826, while his colleague and friend, Dr. Hemprich, died during the voyage at Massaua, 1823. In company with Humboldt and Gustav Rose, he undertook, in 1829, a journey to Siberia as far as the Altay Mountains. Since 1827 he has been attached to the University of Berlin, where, commencing in 1830, his various celebrated works on the infusoria were written, through which he disclosed a new, hitherto almost unknown world of minute creation. On the occasion of the semi-centennial anniversary of his promotion to the doctorate, November 8th, 1868, the American Pharmaceutical Association, in common with many other learned societies of the civilized world, offered to the celebrated explorer their felicitations.

Ehrenberg retained his intellectual vigor and pursued his favorite studies to the last. His last work, containing microgeological studies on the minute life at the depth of the sea, appeared 1873.

WILLIAM GRAHAM MACIVOR, director of the government plantations at Ootacamund, Neilgherry Mountains, East India, died there recently. The great success from the very beginning of the transplantation of the cinchonas to India is mainly due to his excellent judgment, close observations and sagacious management. Flückiger and Hanbury speak of him that, in connection with the Neilgherry plantations the name of him must always be remembered, who, by his rare practical skill and sagacity in the cultivation and management of the tree, has rendered most signal services in its propagation in India; and Soubeiran and Delondre recognize his services in saying: "Si en effet Mr. Markham a été la tête de l'entreprise, Mr. MacIvor en a été assurément le bras."

ALBERT C. CURTIS.—We regret to learn of the sad fate of this promising young man, who was murdered about the last of June, near Laramie City, Wyoming Territory. He hailed from Ashland, Ohio, where he learned the drug business under the instruction of Dr. W. K. Foltz. In 1871 he graduated at the University of Michigan, and in 1872, at the Philadelphia College of Pharmacy. Subsequently he served as Assistant in Cleveland, which city he left a little over two years ago, and owing to failing health removed to Wyoming Territory. An abstract of his thesis was published in this journal 1872, p. 485.

THE AMERICAN JOURNAL OF PHARMACY.

SEPTEMBER, 1876.

CONTRIBUTIONS FROM THE SCHOOL OF PHARMACY OF THE
UNIVERSITY OF MICHIGAN.

Communicated by PROF. ALBERT B. PRESCOTT.

IV. *Examination of the Resinoids Podophyllin, Cimicifugin, and Hydrastin. Also the Determination of Berberina by Mayer's Solution.* By L. F. BEACH, Ph.C.

Samples of so-called *Resinoid Podophyllin*, from three manufacturers, were examined with the following results :

	No. 1.	No. 2.	No. 3.
Berberina, ¹	Traces.	None.	Traces.
Residue (of resin) after treating 1 gram with 2 f. oz. acidified water,	0.830	0.698	0.840
Portion soluble by treating 1 gram with 10 cc. of water, ¹	0.060	0.163	0.099

No inorganic constituents, no starches, and no sugar could be found in any of the samples.

Samples of *Resinoid Cimicifugin* of two manufacturers were examined as follows :

No metallic salts, no starches and no appreciable portion of sugars could be found in either. Both were very nearly all soluble in alcohol. The solubility of each in water and in benzene was ascertained by digesting one gram in a flask with 10 cc. of the solvent, then filtering and washing the residue with 5 cc. more of the same solvent, the total filtrate being evaporated to dryness and its residue weighed :

Dissolved by the water, from No. 1, 0.035 ; from No. 2, 0.092

“ “ benzene, “ “ 0.110 ; “ “ 0.152

No. 1 was examined according to T. E. Conard's directions² for

¹ The amount of alkaloid in Nos. 1 and 3 was hardly sufficient for a precipitate of potassium mercuric iodide solution, but gave distinct precipitates with phosphomolybdic acid and a decided reaction with Kluge's test, given in "Proc. Am. Phar. Asso.," 1875, p. 426.

² "Am. Jour. Phar." 1871, 151 ; "Proc. Am. Phar. Asso.," 1871, 264.

separating a crystallizable principle from the root of *Cimicifuga racemosa*, and the crystallized principle obtained from the resinoid. It crystallized in the hexagonal system.

Samples of *Resinoid Hydrastin*, as sent out by six manufacturers, were examined. In each case, one gram of the resinoid was exhausted with boiling water, till the washings gave no turbidity with potassium mercuric iodide. The residue was dried and weighed. The water solution was concentrated, treated with hydrochloric acid, and successive crops of crystals obtained, dried and weighed as berberina hydrochlorate. The mother liquor was saturated with ammonia, and its precipitate obtained as hydrastia. The following percentages were found :

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Berberina hydrochlorate,	35.1	21.9	6.9	28.0	36.0	100.0
Hydrastia,	1.7	17.4	6.7	5.1	6.8	0.0
Insoluble in hot water,	25.0	21.1	23.5	29.6	25.2	0.0

In the work on No. 1, trial was made for the third alkaloid found by A. K. Hale in hydrastis root,¹ but none being found, the ammonia was added in excess for the hydrastia. The filtrate from the precipitate of hydrastia still gave a slight precipitate by Mayer's solution, therefore the proportions of hydrastia are all a trifle too low, but suffice for correct comparison.

A Volumetric and a Gravimetric Method for Determination of Berberina by Potassium Mercuric Iodide. The precipitation of berberina by this solution is a close one, but the investigator found no statement of the amount of berberina precipitated by a cc. of Mayer's standard of the solution.

Firstly, it was ascertained that a precipitate of berberina, formed by any excess of the potassium mercuric iodide solution, weighs exactly twice as much as the pure berberina which enters into the precipitate. The precipitate should be dried at about 100° F. One-half the weight of the precipitate equals the berberina. In determining this value, a sample of pure berberina was prepared by extracting a solution of well crystallized hydrochlorate by chloroform in presence of slight excess of potassa, and evaporating the chloroform. Of the pure alkaloid, 0.050 gram was dissolved in acidified water and the solution divided into five equal portions. To these portions were added, respectively, $\frac{1}{2}$ cc., 1 cc., 2 cc., 3 cc. and 4 cc. of Mayer's solution; the

¹ "Am. Jour. Phar." XLIV. (1873), 247; also XLVII. (1875), 481.

mixtures warmed on the water-bath, the nicely settled precipitates gathered and washed on small tared filters and so dried at near 100° F. The weight of precipitate in each case came very near to 0.020 gram. Again, 0.025 gram of the purified alkaloid was taken, and the precipitate found to weigh 0.0495 gram.

Secondly, by noting carefully the number of cc. of Mayer's standard solution¹ required in obtaining the precipitates—then obtaining the weight of the clean, dry precipitates—it was ascertained that 1 cc. of the solution precipitates 0.0425 gram of berberina, weighed as base. The volumetric determination is slow, from the length of time required for the precipitate to settle after each addition of reagent. Traces of precipitate are observed by placing a drop on a blue or black glass slide.

V. Examination of the "Resinoids," Sanguinarin, Leptandrin and Aconitin. By J. R. LITTLE, Ph.C.

Firstly, as a means of comparing the samples of different manufactures, and as some indication of their constituents, the following determinations of solubilities were made:

SANGUINARIN—0.500 GRAM TAKEN.

	No. 1.	No. 2.	No. 3.
Residue insoluble in 25 cc. water,	0.327	0.346	0.357
" " 10 cc. alcohol,	0.140	0.205	0.294
" " 10 cc. Decinormal Solution of Potassa,	0.331	0.312	0.389
" " 10 cc. Ether, ²	0.163	0.345	0.330

LEPTANDRIN—0.500 GRAM TAKEN.

	No. 1.	No. 2.	No. 3.	No. 4.
Residue insoluble in 25 cc. water,	0.310	0.183	0.190	0.224
" " 10 cc. alcohol,	0.155	0.265	0.094	0.193
" " 10 cc. Decinormal Solution of Potassa,	0.202	0.338	0.078	0.140
" " 10 cc. Ether, ²	0.187	0.316	0.217	0.116

By Schiel's method³ for the extraction of the alkaloid from blood-root, *sanguinarin* No. 1 was found to contain of the *alkaloid sanguinarina*, 6.2 per cent. By another method *sanguinarin* No. 3 was found

¹ 13.546 grams mercuric chloride, and 49.8 grams potassium iodide, in water to make one litre.

² The filtrate was made to measure 10 cc.

³ "Husemann's Pflanzenstoffe," S. 200.

to contain 6.0 per cent. of the alkaloid sanguinarina. The last named method was devised as simpler than Schiel's, and is as follows: 0.500 gram of the resinoid is exhausted with ether, till the washings give no precipitate with phosphomolybdic acid, and the solution fully precipitated by this reagent. The phosphomolybdate precipitate is then digested with solution of potassa, the mixture exhausted with chloroform, and the chloroform solution evaporated—to weigh the residue as alkaloid.

Sanguinarina No. 3 contained *magnesia*. It was of lighter color than Nos. 1 and 2.

Leptandrin, Nos. 1 and 4, each gave marked qualitative evidences of an alkaloid, and No. 2 gave slight results for the same. These evidences consisted of precipitates (in acidulated water solution of the extracted material) by potassium mercuric iodide, phosphomolybdic acid, metatungstic acid and other general precipitants of alkaloids; a brown color with Frøehde's reagent, but no color with sulphuric acid, and with nitric acid a slight yellow color not affected by stannous chloride. Preparatory to these tests for an alkaloid, the "resinoids" were treated with acidulated water, and the filtered solution treated with ammonia and exhausted with chloroform, and the chloroform solution evaporated to a solid.

Leptandrin No. 1 contained traces of a *lead* salt, and No. 2 contained 18 per cent. of *magnesia*. No. 3 was in dark colored vitreous fragments; the others pulverulent and of lighter color.

Two manufactures of resinoid *Aconitin* were examined. No. 1 gave of the *alkaloid* aconitia, by Mayer's volumetric method, 3.34 per cent.; by the gravimetric determination (described below) 4.17 per cent. No. 2 gave, volumetrically, 4.16 p. c., gravimetrically, 4.34 p. c. For these determinations, the resinoids were extracted by acidulated water.

Owing to the imperfect subsidence of the precipitate in Mayer's method, it was sought to find *the gravimetric value of the precipitate of aconitia by potassium mercuric iodide solution*. A sample believed to be pure alkaloid was obtained, and 0.100 gram dissolved, and treated with an excess of the reagent, gave a precipitate, which, when dry, weighed (in three trials very nearly) 0.170 gram. This value was used in obtaining the gravimetric results above stated.

Aconitin No. 1 contained 11 p. c. of magnesium carbonate, and No.

2 gave abundant qualitative tests for the same substance. No. 1 was dark colored, moist and sticky.

VI. *Analysis of eleven specimens of the "Native Sulphide of Antimony," sold in Pharmacy.* By WM. C. SHEFFIELD, Ph.C.

These samples of "black antimony," or "black sulphur," as it is often called, were obtained at as many different retail drug stores, in four cities in Ohio and Michigan. They were subjected to qualitative and quantitative analyses, and the following percentages obtained :

No.	Antimonious sulphide.	Arsenious sulphide.	Carbon, as charcoal.	Silicious matter.	Ferrous sulphide.	Calcium carbonate.	Magnesium, as sulphate.	Total determined.
No. 1 - - -	31.5	6.6	8.9	17.2	2.5	22.0	7.5	96.2
" 2 - - -	0.0	1.2	16.5	73.5	1.5	3.5	1.6	97.8
" 3 - - -	0.0	trace.	12.5	67.5	4.4	5.5	3.7	93.6
" 4 - - -	0.0	4.2	34.7	7.0	6.2	22.0	22.8	96.9
" 5 - - -	0.0	1.2	55.5	37.5	2.3	1.1	0.9	98.5
" 6 - - -	0.0	0.0	11.7	79.3	7.5	0.0	0.0	98.5
" 7 - - -	0.0	0.0	45.6	9.0	1.1	26.6	13.5	95.8
" 8 - - -	0.0	0.0	20.0	77.5	1.1	0.0	0.0	98.6
" 9 - - -	0.0	0.0	28.4	33.8	4.6	20.9	10.3	98.0
" 10 - - -	0.0	0.0	60.6	14.3	1.6	14.2	6.6	97.3
Average - - -	3.1	1.3	29.4	41.6	32.8	11.6	6.7	
No. 11 - - -	Very nearly pure antimonious sulphide, with a trace of arsenic.							

These results may be of interest to some one curious to know whether any dispensing pharmacist ever makes all his antimonial preparations as provided by the "Pharmacopœia." Also, they may be of interest to Mr. Bergh, of New York.

VII. *Valuation of eight samples of Precipitated Sulphur, alias Milk of Sulphur, as found in the Market.* By C. W. L. DIETRICH, Ph.C.

These samples were obtained at different dispensing pharmacies, six in Grand Rapids and two in Ann Arbor, Michigan. They were all

sold as Precipitated Sulphur, or Lac Sulphur—the distinction between these terms which the law has enforced in Great Britain not being regarded here.

No. 1 contained 43·6 p. c. of calcium sulphate.

No. 2 " 25·9 " " "

No. 3 was free from calcium sulphate.

No. 4 " " " " "

No. 5 contained 47·7 p. c. of calcium sulphate.

No. 6 " 47·3 " " "

No. 7 " 46·2 " " "

No. 8 " 23·7 " " "

No arsenic, no free sulphuric acid and no other impurity, save a third of a per cent. of silicate in Nos. 3 and 4, was found in any of the samples.

Evidently six of the eight specimens were manufactured by precipitating the lime solution with sulphuric instead of hydrochloric acid (a process having older than centennial authority¹) and, therefore, represent that useful article (having all the virtues of sulphur in a more eligible form, etc.) which our better regulated British cousins in pharmacy are permitted by their rigorous magistrates to sell as milk of sulphur, but not as precipitated sulphur.

VIII. *Analysis of six nostrums sold as Ague-cures.* By O. L. CHURCHILL, Ph.C.

Five of these articles were found to contain one or more of the cinchona alkaloids (chiefly the cheaper alkaloid); the remaining one contained no alkaloid. None contained arsenic, strychnia, or mercury.

The quantitative determination of the alkaloids, from well known difficulties, is presented as only approximate. The following was the general plan of separation, modified in several particulars as found necessary for each mixture. From a weighed portion of the mixture, the alcohol, if any, was evaporated; the residue diluted with acidified water and filtered (more than once if need be); the filtrate precipitated by a slight excess of caustic soda; in most cases, the precipitate dissolved in acidified water, the solution concentrated and dissolved with strong alcohol, the filtrate evaporated and the residue dissolved with water. Care was taken to avoid loss, by well washing the residues of extraneous matter, and not washing the precipitates of alkaloids at all

¹ "The London Pharmæcopœia" of 1720.

or but slightly. Taking a final precipitate by caustic soda, the alkaloids were then approximately separated from each other by use of ether as a solvent, potassium iodide to precipitate quinidia, potassium sodium tartrate to precipitate cinchonidia, etc.¹

1. "Ayer's Ague-Cure." Each bottle contains six fluidounces of a dark red syrupy liquid, with a very slight white sediment. Taste, very bitter and slightly peppery, with a slight taste and odor of winter-green oil. An alcoholic extract (tincture) of cinchona bark, with additional and amorphous cinchona alkaloids (chinoidin), heavily saccharine and slightly aromatized. It contains a resin which presented the physical properties and gave apparently the physiological effects of podophyllum resin, but it was not so far separated from cinchona constituents as to be positively determined. It has free and combined sulphuric acid and the white sediment is calcium sulphate (from the calcium salts of the bark). In one fluidounce :

Amorphous alkaloids (Chinoidin),	3.2 grains.
Cinchonia,	3.0 "
Cinchonidia,	0.7 "
Quinia,	0.8 "
Quinidia,	1.0 "
Total,	8.7 "

The cost of a bottle will not exceed 35 cents—the price being at wholesale, 65 cents, and at retail \$1.

2. "Wilhoft's Antiperiodic Fever and Ague Cure." The bottle contains four fluidounces of a thin, dark-red liquid, with the odor of cinchona bark, a very bitter and acid taste, and acid reaction. It consists essentially of an infusion of cinchona bark made with water containing aromatic sulphuric acid (like those of the U. S. P.), and probably with an addition of quinia sulphate. One fluidounce contains 3.0 grains of quinia and 5.4 grains of free and combined sulphuric acid (1.5 grains free). Cost of a bottle, not over 25 cents ; price, \$9 per dozen, \$1.50 per bottle.

3. "Christie's Ague Mixture." A bottle contains seven fluidounces of a very dark, syrupy liquid one-fourth filled with sediment, and having a very bitter and peppery taste and an odor of common molasses. The sediment was powdered capsicum and a little resinous

¹ Flückiger & Hanbury's Pharmacographia, 327.

matter. The solution consists of a tincture of cinchona bark (the alcohol being 30 per cent. by weight), with cinchonia sulphate, and common molasses. Cost, not over 25 cents per bottle ; price, at wholesale, 62 cents ; at retail, \$1.

4. "Peterman's Michigan Ague Cure." Each bottle contains five fluidounces of a red, syrupy liquid, with much resinous sediment, a very bitter taste, and odor of cinchona. Contains an alcoholic extract of the bark, with chinoidin as the chief medicinal agent, and with a little sulphuric acid and syrup. Cost, complete, not over 25 cents per bottle ; price, at wholesale, 60 cents ; at retail, \$1.

5. "Jayne's Ague Mixture." In each bottle, seven and a half fluidounces of a mixture having an odor and taste of rhubarb, dandelion and common molasses. It contains quinia sulphate and traces of other cinchona alkaloids, but not enough to render the mixture very bitter. The alkaloids were, with some difficulty, separated by benzene in presence of alkali ; other means having failed. Cost, about 35 cents ; price, at wholesale, 60 cents ; at retail, \$1.

6. "Rhodes' Fever and Ague Cure, or Antidote to Malaria." In each bottle, twelve fluidounces of a black turbid liquid having a sweet and astringent taste. On standing, the sediment filled one-third of the bottle. The sediment is charcoal. The solution contains a little tincture of chloride of iron, partly reduced to ferrous salt by sugar, which is present ; also a trace of sulphuric acid, (a trifle of ferrous sulphate may have been added). Nothing more. "Bottle to be well shaken," etc.; "one tablespoonful three times a day. "Most people could take three times the amount without any uncomfortable feelings." "Persons who find it to bring on unwished-for actions, should place the contents of two or more bottles in an open dish in their sleeping-apartments." Price, at retail, \$1.

NOTES ON THE GENUS *TEUCRIUM*.

BY JOHN M. MAISCH.

(*Read at the Pharmaceutical Meeting, held August 15th.*)

In the search for remedial agents, physicians sometimes resort to drugs which have been formerly employed medicinally and have fallen into disuse on account of their indifferent properties, or because other more active and reliable medicines have taken their place ; occasion-

ally a remedy is neglected and forgotten, and its valuable qualities have to be, as it were, rediscovered, or it comes to the surface once more, merely, as it seems, for the purpose of proving that we can well get along without it. Such thoughts came to my mind when, a short time ago, a prescription was shown to me calling for *Extractum Teucrii scordii fluidum*, an almost obsolete European remedy in an American form.

Teucrium scordium, Lin., germandrée aquatique of the French, Lachenknoblauch of the Germans, is usually called water germander in English, because it grows in moist, swampy meadows, near ponds, &c. It is found in Western Asia and throughout a large portion of Europe. Forty years ago it was officinal in most "Pharmacopœias" of continental Europe, but since then has been dismissed in the revised editions of nearly all, retaining a place in a few only.

The plant belongs to the natural order of Labiatae, a family of plants which is characterized by the complete absence of deleterious properties, the active constituents found in them being chiefly volatile oil, associated in many with more or less of a bitter, non-alkaloidal principle, and occasionally with a little tannin. The medical properties of the labiatae are therefore mainly carminative and stimulant, and frequently tonic and stomachic. They are mostly indigenous to the temperate regions of the old world, the number indigenous to this country being comparatively small; but many species have been introduced here from Europe, and completely naturalized in some sections of the United States.

The genus *Teucrium* is classed with the tribe *Ajugoideae*, which has the upper lip short, or deeply notched and turned forward so as to appear wanting, the four ascending stamens projecting through the slit in the upper lip. Several of the European species formerly enjoyed a high reputation, among them the one mentioned, which, together with the allied species *T. scordioides*, Schreb., is regarded to be the *Σχορδιον* of Dioscorides. The plant is softly pubescent, attains a height of 12 to 18 inches, has sessile, oblong, serrate leaves and rose-colored flowers, two or three of which are found in the axils of the leaves. The second species differs mainly by being villous and having cordately ovate, somewhat clasping leaves. Both possess a bitter taste, and, in the fresh state, a distinctly alliaceous odor; it was formerly in repute as an antiseptic and diaphoretic internal remedy for gargles, and as a

dressing for foul ulcers. "The New London Dispensatory," printed in 1676, says of it: "It is Lyptintick, Abstersive, Traumatick, Alexipharmick, Sudorific, Anodyne and Pectoral; it opens Obstructions of all the principal Parts, cleanseth the Intrails and old Ulcers; provokes Urine and the Terms; expectorates rotten Matter out of the Chest; helps old Coughs, Asthmas, Pleurisies, inward Ruptures, Biting and Stinging of Serpents, and potently resists Poison, Plague and all pestilential Diseases. It exhilerates the Heart, cures the Bloody-flux, comforts the Stomach, and drives out the Small Pox and Measles. Outwardly, it cleanseth and heals Wounds and Ulcers, and cures Pains of the Gout. The Essence is most effectual to the Intentions aforesaid."

Similar but more feeble virtues were attributed to *T. Scorodonia*, Lin., s. *Scorodonia heteromalla*, Moench, likewise a European plant, which differs from the former in having petiolate, cordate-ovate leaves, a more distinctly two lipped calyx and yellow corolla.

The fluid extract of water germander may be made by the officinal process for fluid extract of chimaphila, and may be given in doses of one-half to one teaspoonful.

The following European species were formerly employed medicinally for their stimulating and tonic properties, and some still enjoy some popularity as domestic remedies in localities where they occur.

T. Polium, Lin., with sessile linear-lanceolate, crenate and tomentose leaves and terminal white flowers.

T. montanum, Lin. Leaves similar, with a revolute margin and terminal yellowish flowers.

T. creticum, Lin., resembling the preceding, but the blueish flowers axillary and single. The closely allied *T. rosmarinifolium*, Lam., has the branches longer and more slender, and the flowers in cymules of three in the axils of the bracts.

T. flavum, Lin., has its greyish-yellow flowers similarly arranged; but the petiolate leaves are ovate and crenate.

T. fruticans, Lin., is the *Erba di S. Lorenzo* of Southern Italy, and has entire, oblong or oval, sub-coriaceous leaves, and single axillary flowers with blueish corolla.

T. chamaedrys, Lin., the *Χαμαδρυς* of Dioscorides; leaves short petiolate, ovate to obovate, cuneate at base, crenately serrate; flowers 1 to 3, axillary with purplish-red corollas.

T. botrys, Lin. Leaves triangular-ovate in outline, pinnatifid; flowers axillary, in threes; corolla pale red, punctate in the throat.

These and a few other species, indigenous to Southern Europe and the basin of the Mediterranean, most probably do not differ in their medicinal properties from *Teucrium Canadense*, Lin., the wood sage or germander of the United States and Canada.

Somewhat different properties are met with in *T. marum*, Lin., cat thyme, or Syrian herb mastich, which is found in the countries bordering on the Mediterranean. Its leaves are petiolate, ovate or ovate-oblong, rather acute, white tomentose beneath; the rose-red flowers are single in the axils of the bracts, and form a terminal one-sided raceme. It has a strong aromatic, somewhat camphoraceous odor, and an aromatic, bitterish and acrid taste. It has been employed internally, in doses of 20 to 60 grains, in various spasmodic and other nervous disorders, and externally chiefly for its errhine properties; it constituted the active ingredient of the *Pulvis sternutatorius* of some old European "Pharmacopœias," which was composed of sweet marjoram 3 parts, cat thyme, lily of the valley and orris root, of each one part. Cat thyme is prescribed in Europe under the name of *Herba mari veri*.

ON FUCUS VESICULOSUS AND SOME ALLIED SPECIES.

BY JOHN M. MAISCH.

(Read at the Pharmaceutical Meeting August 15th.)

Though Theophrastus already, in his history of plants, mentions several species of marine algæ, the sea wrack does not appear to have been employed medicinally before the first half of the eighteenth century; I find, at least, no mention made of it in the new "London Dispensatory" of 1676. Russell seems to have been instrumental in introducing it into medicine through his essay, "De tabe glandulari," which was published in 1750, and in which he specially recommended *Fucus vesiculosus* in the form of charcoal and jelly, the former, known afterwards under the name of *Æthiops vegetabilis*, being prepared by heating the plant in a crucible closed with a perforated cover until smoke ceased to be given off, while the latter was made by expressing the mucilaginous liquid, and also by macerating the fucus in an equal weight of sea-water for two weeks, or until it was converted into a kind of jelly, which was employed both externally and internally. Upon the

strength of these observations *Fucus vesiculosus* was admitted into several pharmacopœias, but was afterwards dismissed, the last one dropping it being the "Dublin Pharmacopœia," in the edition of 1850. The beneficial effects in scrofulous swellings and goitre of the vegetable ethiops and of the sponge charcoal, which had been introduced by Arnaud de Villeneuve near the close of the thirteenth century, and the discovery of iodine in the ashes of sea-plants, induced Dr. Coindet, of Geneva, in 1819, to study the effects of iodine, and led to the introduction of this element into medicine. Subsequently, Duchesne Duparc, and after him Godsfrey, stated (1862) that they had found this fucus to possess valuable properties as a remedy for morbid obesity, an observation which, by later investigators, does not appear to be confirmed to the full extent mentioned by the first recommenders in this complaint.

Of late, the bladder wrack, it seems, has been employed medicinally to some extent in the United States, so that a brief description of this and some allied species may be desirable.

The genus *Fucus* belongs to the suborder Fucoideæ or Melanosporeæ of the natural order Algæ. As originally constituted by Linnaeus, it embraced several genera which have been separated by later authors, and among which are the genera *Laminaria*, *Sargassum* and *Cystoseira*, the last-named having the thallus usually inflated into vesicles which often show a moniliform arrangement, while the vesicles of *Sargassum* are stipitate. *Fucus* has either a cylindrical (filiform) or flat, usually forking thallus, and the sporocarps inflated and usually terminating the branches. In their fresh state they have an olive or brownish-green color, becoming blackish on drying. Several species have portions of the thallus inflated so as to form hollow vesicles.

Fucus vesiculosus, Lin., attains the length of 1 to 3 feet, and has a flat thallus $\frac{1}{2}$ to 1 inch wide, with the margin entire and a distinct mid-rib running the entire length of the thallus; the vesicles are always in pairs, one being placed on each side of the mid-rib, spherical or oblong globular in shape, and occasionally attaining the size of a hazelnut. It grows on rocky sea shores of the Atlantic Ocean, near high-water mark, and in marshes which are occasionally overflowed by the tide. Formerly it was known by the name of *quercus marina*, or sea oak, its common English names being *bladder wrack*, *sea-wrack*, *sea-ware*, *kelp-ware* and *black tang*. In Scotland and other northern countries it is

used in winter for feeding horses, cattle and sheep, and is eaten by deer when other food is scarce.

F. nodosus, Lin., knobbed sea-wrack, grows in similar localities, but at or near low-water mark. It attains a length of 4 to 6 feet, and has a narrower veinless frond, with the branches almost filiform at the base, the vesicles single in the center of the thallus, or frond, ovate in shape and usually quite large.

F. serratus, Lin., has a veined and serrate frond, and is destitute of vesicles.

F. siliculosus, Lin., s. *Cystoseira siliquosa*, Agardh, has a very narrow frond, 2 to 4 feet long, with short branches, articulated vesicles and lanceolate flattened sporocarps.

F. natans, Lin., s. *Sargassum bacciferum*, Agardh, the gulf-weed of the Atlantic Ocean, is often found in immense masses floating in the sea. Its frond is terete, with the branches linear and serrate and the vesicles globular and acuminate.

All these and many allied species appear to be very similar in their constituents, of which they contain mucilage, mannit, odorous oil, bitter principle and a considerable proportion of saline matter, varying from 14 to 20 per cent., calculated for the dry plants. According to Gödeschen, James and others, the variation is just as great for the bladder wrack as collected in different localities, and it is not impossible that this may be, at least in part, accounted for by having been collected in different seasons, the plant being assumed to be most active when collected after the sporocarps have formed, about the month of July. E. Marchand found (1865) in the ashes of *F. vesiculosus* 0.719 per cent. iodine and 0.603 per cent. bromine; in *F. siliculosus* nearly the same amount, and in *F. serratus* 0.834 iodine and 1.007 bromine, while the ashes of the fucoideæ *Laminaria digitata*, Lamx. contained 5.352 iodine and 0.774 bromine, and *Lam. saccharina*, Lamx. about one-half these amounts (see also "Am. Jour. Phar.," 1854, p. 438).

Bladder wrack has been employed in France in the form of extract, prepared, according to Dannecy, by exhausting the plant with 54 per cent. alcohol; it is stated to represent 15 parts of the fucus ("Proc. Am. Phar. Assoc.," 1863, p. 66); also in the form of syrup, suggested by Potier (Ibid.), by exhausting 150 parts of the powdered plant with 14 per cent. alcohol, evaporating the tincture to 230 parts and dissolving in it 370 parts of sugar; 20 grams (1 tablespoonful) of this

syrup represents 0.6 grm. of the extract and 5 grm. of the fucus, which is the average dose. A fluid extract might doubtless be prepared by a process similar to the officinal one for fluid extract of chimaphila; the average dose of such a preparation would be about a teaspoonful. If, however, the virtues depend mainly upon the iodine and bromine present, the dose would have to be increased very considerably.

THE COMPARATIVE PRICE OF BOUGHT AND SELF-MADE CHEMICALS AND PHARMACEUTICAL PREPARATIONS.

BY G. H. CHAS. KLIE.

Speaking of the preparations of the "Pharmacopœia," one often hears the remark from apothecaries, "It does not pay to make them." Although this is true in regard to a good many, still there is quite a number the manufacture of which by the apothecary repays him amply. The table below comprises 50 chemicals and pharmaceutical preparations, the cost of making which has not been arrived at by mere theoretical calculation, but by practical experiment. The figures of the first column give the wholesale price current in this locality; those of the second column show what each preparation may be made for by the apothecary; the third column gives the difference, and the fourth shows the percentage of gain or loss.

It must be here remarked, that profit or loss cannot in all instances be the same, because the prices of drugs fluctuate, and one party is apt to handle the ingredients more economically than another. The practice of strict economy in manufacturing has an appreciable bearing on the profit:

	Wholesale Price.	Cost of own preparation.	Difference.	Per cent.
	\$ cts.	\$ cts.	\$ cts.	
Acidum phosphoricum dilutum,	lb. 0 30	0 20	0 10	Prof., 33'33
Ammonii bromidum,	" 1 00	0 75	0 25	" 25'00
Antimonii oxidum,	" 1 00	1 15½	0 15½	Loss, 15'75
Calcii hypophosphis,	" 3 00	2 63	0 37	Prof., 12'33
Collodium,	" 1 10	0 76½	0 33½	" 30'45
" cantharidale,	" 3 75	1 31½	2 43½	" 64'93
Extractum aloes aquosum,	" 2 00	1 10	0 90	" 45'00
" cannabis indicæ,	oz. 1 14	0 60	0 54	" 47'36
" colocynthis pulv.,	lb. 5 00	3 75	1 25	" 25'00
" " cp. "	" 3 58	2 80	0 78	" 21'78
" conii alcoholicum,	" 1 93	2 06	0 13	Loss, '06
" digitalis "	" 2 20	1 36	0 84	Prof., 38'18

	Wholesale Price.	Cost of own preparation.	Difference.	Per cent.
	\$ cts.	\$ cts.	\$ cts.	
Extractum gentianæ,	" 0 75	0 38	0 37	Prof., 49'33
" hyoscyami alcoholicum,	" 3 30	2 59	0 71	" 21'51
" jalapæ,	" 4 50	1 03½	3 46½	" 76'94
" nucis vomicæ,	oz. 0 55	0 59	0 04	Loss, '07
" opii,	" 2 25	0 92½	1 32½	Prof., 58'88
" rhei alcoholicum,	lb. 4 95	2 40	2 55	" 51'51
" belladonnæ fluid.,	" 1 80	0 62	1 18	" 65'55
" cimicifugæ "	" 1 10	0 50	0 60	" 54'54
" digitalis "	" 1 35	0 53	0 82	" 60'74
" ergotæ "	" 3 15	0 98	2 17	" 68'88
" cort. aurantiorum fluid.,	" 0 82½	0 39	0 43½	" 52'72
" ipecacuanhæ "	" 4 13	1 85	2 28	" 55'20
" liquiritiæ "	" 0 82½	0 40	0 42½	" 51'51
" gelsemini "	" 2 05	0 73	1 32	" 64'39
" pruni virginianæ "	" 0 88	0 40	0 48	" 54'54
" rhei "	" 2 30	1 42	0 88	" 38'26
" sarsaparillæ cp. "	" 1 37½	0 72 1-5	0 65 3-10	" 48'21
" sennæ "	" 0 82½	0 36½	0 46	" 55'75
" senegæ "	" 1 93	1 22	0 71	" 36'77
" uvæ ursi "	" 0 82½	0 39	0 43½	" 52'72
Ferri citras,	" 1 45	1 30½	0 14½	" 10'17
" et potassii tartras,	" 1 00	0 42½	0 57½	" 57'25
" pyrophosphas,	" 1 35	1 09½	0 25½	" 18'70
" et quiniæ citras,	" 8 50	5 29	3 21	" 37'14
Hydrargyri iodidum rubrum,	oz. 0 50	0 20	0 30	" 60'00
" " viride,	" 0 45	0 32	0 13	" 28'88
Liquor ferri tersulphatis,	lb. 0 50	0 11½	0 38½	" 77'00
Morphia,	oz. 4 75	4 35 2-5	0 39 3-5	" 0'08
Pilulæ quiniæ sulphatis, s. c. 1 gr.	500 4 00	2 45	1 55	" 38'75
Potassii acetas,	lb. 0 60	0 52	0 08	" 13'33
" bromidum,	" 0 70	0 68½	0 01½	" 0'02
" ioididum,	" 2 75	2 84	0 09	Loss, 0'03
" tartras,	" 0 60	0 58	0 02	Prof., 0'03
Pyroxylon,	oz. 0 50	0 16	0 34	" 68'00
Quiniæ tannas,	" 2 30	1 27	1 03	" 44'78
" valerianas,	" 6 40	4 65	1 75	" 27'34
Resina jalapæ,	" 0 75	0 41	0 34	" 45'33
Sodii hypophosphis,	lb. 3 00	2 70	0 30	" 10'00

In the cost of own preparation, work has not been calculated. Where, in the fourth column, "Loss" is mentioned, it means so much per cent. cash loss beside the labor.

The average profit, or pay for work, amounts to 37'64 per cent. Of the pharmaceutical preparations alone, the average is 45'82 per cent.; of chemicals alone, 25'36 per cent. The average profit on solid extracts amounts to 36'28 per cent., and on fluid extracts 54'24 per cent., showing that the manufacture of fluid extracts is the most profitable.

N. St. Louis, Mo., July 17, 1876.

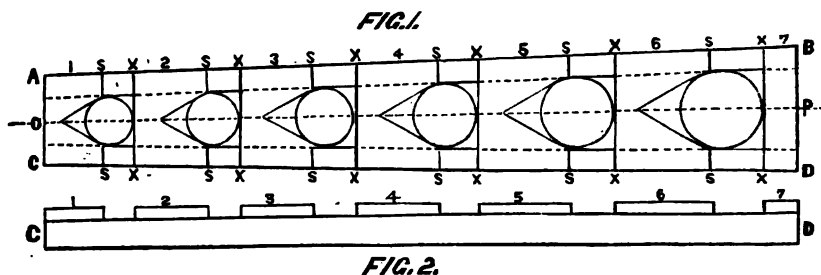
ADJUSTABLE SUPPORTS FOR FUNNELS, PERCOLATORS, ETC.

BY E. C. H. HILDEBRAND.

The sides of an equilateral triangle coming as tangents in contact with the periphery of an inclosed circle, mark out in the latter three arcs of equal lengths; further, by drawing a line through the triangle parallel to one of its sides, an equilateral triangle of smaller size is formed, relating to a correspondingly smaller circle. This, in a few words, is the theory applied in the construction of the here described adjustable support or rack for funnels, etc.

An opening of the shape of an equilateral triangle presents a very solid rest for vessels of a conical or spherical form, and the resistibility of the round form against an external pressure, exerted in three symmetrical points on its circumference is very large, even in vessels made of thin material. As it is very desirable to have in the pharmaceutical laboratory a series of supports for funnels, etc., especially now, where the process of repercolation is so much in use, I think this adjustable rack will soon prove the many advantages it possesses over similar arrangements of this kind.

From the illustrations it will be seen that this rack represents a frame consisting of two long pieces of wood—staves of an oblongly square shape—A B and C D, placed in a divergent position to each other and united by cross pieces, 1, 2, 3, etc., a part of which is cut out, leaving an open space of 60 degrees (the value of an angle in an equilateral triangle), which, together with the following crosspiece, forms the opening for the reception of the vessel. As gradually by the divergence of the long staves, the successive openings grow larger, they are quali-



fied to receive larger vessels. Each of these openings is adjustable to vessels of different sizes. To fit a certain opening to a given vessel,

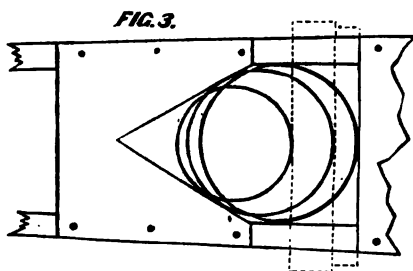
give the triangular space the required size by interposing quadrangular staves between the top pieces, across the rack, as shown in Fig. 3.

In order to enable the reader to construct this rack for himself, I suggest as the shortest way, to make first a drawing of natural size in the style of Fig. 1. Pin several sheets of packing paper on a counter, one in continuance of the other and of the desired length of the rack. Draw A B and C D, and construct a basis for operation line, O P, in the middle between A B and C D. Next, make a pattern of pasteboard or wood, representing an equilateral triangle. This is done by drawing on the material to be used a circle of about 9 inches radius, carrying the latter as a cord around the periphery six times, thus marking out six points, three of which (every second one) are connected by straight lines. The thus formed equilateral triangle is cut out as a pattern, one side of which is divided by a lead pencil mark into two halves. This marked side represents the "base" of the triangle, and the angle opposite may be termed the "point." Lay the pattern on the drawing, point and mark covering line O P. The point standing about two inches from O, draw the angle of crosspiece 1, touching the internal sides of A B and C D. Draw, next, the short lines S S across A B and C D, and the first crosspiece is finished. Take, now, a pair of compasses and describe from line O P the largest possible circle between the inner sides of A B and B D, and inside of angle 1. This done, draw line X X at right angle with O P. Two inches from this line, X, place again the point of the pattern as before, draw the angle of crosspiece 2, then lines S S, the circle of proper size, and so on as described, till all the crosspieces are located as shown in the sketch. The exact size of all the parts as well as their location being now given, it is the carpenter's work to execute the whole arrangement out of wood.

The material is pine wood.

The crosspieces are about three-fourths of an inch thick and fastened on A B and C D by means of screws. There are, further, a number of staves to be made as long as the distance of B to D, and from 1 to 2

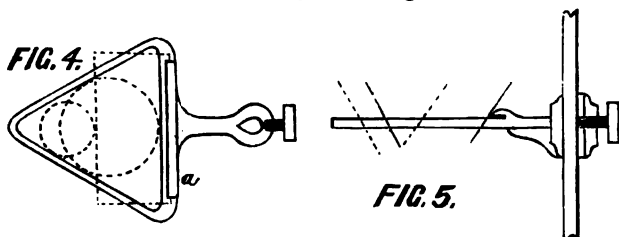
inches broad, for the interposition between the crosspieces, Fig. 3.



The whole arrangement, when finished, is saturated with hot linseed oil and mounted either on four legs or fastened at a distance of about 8 inches to the wall.

To give an illustration, I will mention that the rack in my possession is 13 feet long and has 12 openings for the reception of vessels. The inside width at one end is $10\frac{1}{2}$ inches, at the other $4\frac{1}{2}$ inches. I can insert percolators from 1 pint to 10 gallons capacity. The latter ones (made of the heaviest kind of tinned iron) are frequently charged with 20 pounds of material and the appertaining menstruum, and yet they do not show the least impression from their triangular supports. The packing of the percolators is to be done before putting them into the rack.

Finally, I recommend the adoption of the principle here represented also for the well known iron filtering stands, thereby greatly increasing their usefulness without materially adding to their cost. Large and even the smallest funnels, evaporating dishes, etc., could be equally well placed in or on the same support. Figures 4 and 5 show the de-



tails. The side of the triangle next to the stand is provided with a ridge "a" of such a shape as to form with its trestle a longitudinal notch for the reception of those pieces of different widths of thin sheet iron, which are placed across the triangle to adjust the opening to a certain given vessel.

EXTRACTUM GOSSYPHII RADICIS FLUIDUM.

BY WALTER A. TAYLOR, PH.G.

(Abstract from an Inaugural Essay.)

The supposed emmenagogue effects of the cotton root appear to have been observed among the colored race during their bondage in the South. An old family servant of our family extended me, after an explanation why I wished to know (for she seemed to be rather

superstitious about it), all the knowledge she had concerning the effects of the drug in question; they were in substance as follows: She and those of her fellow-servants that she knew of, were in the habit of gathering the root while the "bole" was either opened or being opened, taking the bark, often the entire root, cutting in fine pieces, and boiling with water for a short time, expressing, and allowing the patient to drink freely of the "tea."

A prominent physician of our city (Atlanta, Ga.) states that, owing to some unpleasant effects following the use of ergot in a case of labor (being an hour-glass contraction of the womb), he was induced to try cotton root; that the cases in which he has employed it are those in which he finds the os uteri sufficiently dilated and relaxed with regular yet ineffectual pains, etc., or, to sum up the whole matter, the presence of every indication of labor, except the expulsive power; and that in these cases he has ever found the cotton root to fulfill every indication. In the latter part of 1870 he employed it in the cases of two mothers of several children, who informed him that they had never passed their previous confinements in less than 36 or 48 hours, but neither one was then in labor more than four hours; that result he can safely attribute to the use of the cotton root; he has also employed it successfully in the sharp, cutting pains which trouble and worry some women several days and sometimes weeks before regular labor sets in. He administers the root in the form of fluid extract or tincture, when he can get a reliable preparation; but so difficult has it been to procure them that he often had to resort to a decoction, which he administered freely.

The fluid extracts made in accordance with the directions laid down in the U. S. P. and those that I have seen from many of the pharmaceutical manufacturers are not stable, and soon become very unsightly, either gelatinizing and completely decolorizing the liquid, or forming a deposit of a peculiar red color, without depriving the liquid entirely of its color. This latter condition seems to be the result of that made from the fresh root.

My first experiments were made with the fresh bark collected in the months of July and August, just six or eight weeks before the picking season commenced. Using stronger alcohol as the menstruum, the liquid passing through had a pale-yellow color, but on standing some time gradually changed into a beautiful red, and after six months has

retained that color, and remained free from any deposit whatever. The preparation made with dilute alcohol underwent the same change of color, but formed a precipitate in the course of three or four weeks. Similar changes were observed in the tinctures prepared with the menstrua named; but an old bark which had been collected about one year yielded with stronger alcohol, at once, a deep-red colored tincture, and the fluid extract prepared from it with this menstruum remained perfectly transparent after three months.

To determine whether the menstruum used had taken up the gelatinous principle, the residue left after making the fluid extract was dried, divided into four equal parts, and treated with mixtures of one part of water, with respectively four, three, two and one measure of strong alcohol; the tinctures were of a light wine-red color, and after three months produced no precipitate. Some of the fluid extract made with strong alcohol was mixed with an equal bulk of water and filtered from the resin; the clear red-colored filtrate soon commenced to separate a precipitate, which rapidly increased. It seems, therefore, as if the gelatinous principle was dissolved by strong and diluted alcohol, but retained in solution by the former.

The gelatinous precipitate from Tilden's fluid extract was found to be partially soluble in solutions of ammonia, potassa and soda, the greenish-red color changing afterwards to red.

From the color changing from a pale yellow to red, in making the fluid extract from the fresh root, and the effect that alkalies have upon it, the probable existence of a chromogene suggests itself. For decolorizing the fluid extract several reducing agents were tried, but it was found impossible to entirely remove the color. Sulphurous acid seemed to be the one that had the best effect upon it, but not sufficiently to admit of further experiment; it is probably best prepared from the fresh root.

The fluid extract is precipitated purplish-black by ferric sulphate, and similar by plumbic acetate.

When a little alcohol is added to the solutions of mercuric chloride, silver nitrate, barium chloride and magnesium sulphate, no precipitates are produced.

COUMARIN AND ITS USES.

BY LOUIS VON COTZHAUSEN, PH.G.

(*From an Inaugural Essay.*)

In preparing coumarin from tonka beans, they were grated and exhausted by ether; on evaporating the solvent, crystals of coumarin, rendered impure by fatty matter, were obtained and purified by repeated crystallization from alcohol. Sixteen troyounces of tonka yielded 117 grains of coumarin. This is the process of Boullay and Boutron-Charlard. A somewhat smaller amount was obtained by substituting petroleum-benzin for the ether, and this solvent is recommended as being more economical. Coumarin was obtained in a similar manner also from the dried herbs of *Asperula odorata*, Lin., *Melilotus officinalis*, Pers., *Liatris odoratissima*, Willd., and *Galium triflorum*, Mich.

The last named herb is frequently collected in this country by Germans under the supposition that it is the *Waldmeister* (*Asperula odorata*) of Germany, which is extensively used there in making the pleasant *May-wine*, which is prepared by macerating the herb in a cheap quality of Rhine wine and adding sugar and a few drops of orange or lemon juice to suit the taste.¹ *Galium*, like *Asperula*, belongs to the order of Rubiaceæ, on drying acquires a fragrant odor, due to coumarin, and contains also an astringent principle, a yellow resin, a fatty, rather unpleasant oil, and grape sugar.

Coumarin is proposed by the author as an ingredient in the following preparations, taking the place of tonka beans and some of the herbs mentioned above:

Extr. New Mown Hay.—Coumarin gr.xii., essence of rose ʒss, cologne spirit ʒii.

Extr. Mille Fleurs.—Coumarin gr.x., oil of cinnamon gtt.ii., oil of rose gtt.iii., oil of neroli gtt.v., oil of lemon gtt.xv., tincture of musk gr.xv., tinct. benzoin gtt.xx., cologne spirit ʒiii.

Extr. Tonquin Musk.—Musk gr.x., cologne spirit ʒiii.; digest, filter and add oil of neroli gtt.i., Coumarin gr.xii., extract of vanilla ʒii.

Fluid Extract of Tonka.—Dissolve tonka ʒviii. with strong alcohol, reserve the first six fluidounces, evaporate the remainder to 2 fluidounces and mix.

¹ Instead of wine, cider is often employed for this purpose, and besides the *Asperula*, small quantities of the leaves of the black currant, strawberry, melissa, speedwell and ground ivy (*Nepeta Glechoma*, Benth.) are sometimes added.—[EDITOR.]

Sachet Mille Fleurs.—Tonka \mathfrak{z} i., vanilla \mathfrak{z} iii., cinnamon and cloves each \mathfrak{z} iv., rose leaves \mathfrak{z} ii., orris root \mathfrak{z} v., oils of mirbane, lavender and rosegeranium each gtt.x., comminute by grating, cutting or bruising, and mix.

May-Wine Essence.—Coumarin gr.iv., spirit of orange (made with freshly grated orange peel), water, each $\mathfrak{f}\mathfrak{z}$ xii.; dissolve, mix, and if desirable, color with caramel. A few ounces are sufficient to flavor a gallon of Rhine or California wine.

EXAMINATION OF THE RHIZOME OF IRIS VERSICOLOR.

BY CARL H. MARQUARDT, PH.G.

(Abstract from an Inaugural Essay.)

Eight troyounces of the rhizome, in moderately fine powder, was exhausted by alcohol, spec. grav. .835, and the alcohol distilled off. The residue had a very acrid taste, and separated into an upper, dark-brown, perfectly transparent layer, and a lower one of a more yellowish color; the former was soluble in alcohol, petroleum benzin, chloroform and ether; the latter dissolved completely in alcohol, partly in ether, and not in chloroform or benzin. The entire residue was exhausted with ether and the solvent evaporated, leaving a dark-brown oleo-resin, of a slight disagreeable odor and a very acrid, persistent taste. Ammonia water dissolved a small portion of it, but effected no complete separation. Treated with cold solution of potassa, a yellowish-white emulsion was formed, from which an *oily liquid* separated, which was purified by dissolving in ether, and had then a light color and a pleasant, bland taste, which after awhile became acrid.

The potassa solution was carefully neutralized with sulphuric acid, concentrated by evaporation, and treated with ether, which dissolved a brown, *soft resin*, possessing the acrid taste in a very marked degree, and yielding with nitric acid a beautiful purple colored mass, becoming yellow and tough after some hours.

The residue left by treating the alcoholic extract with ether was of a yellow color, had a sweet taste, was soluble in water and alcohol, and by Trommer's test proved to be *glucose*.

The dregs exhausted by alcohol, were extracted with diluted alcohol, spec. grav. .941; the light yellow tincture was evaporated to a syrupy consistence and set aside for a week, when a sweet, solid mass

remained. Its solution in water was precipitated by subacetate of lead, and after removing the excess of lead by sulphuretted hydrogen, Trommer's test indicated in the filtrate the presence of *glucose*.

The precipitate on being suspended in warm water and treated with sulphuretted hydrogen, yielded, on evaporating the water, a *yellow mass*, having a peculiar, not unpleasant, bitter taste.

The exhausted powder yielded to cold water some *albumen*, separable by heat, and *gummy matter*, precipitated by alcohol, and the solution of which formed a jelly with ferric chloride (aqueous solution? Editor). Hot water dissolved mainly *starch* from the exhausted powder.

On distilling the fresh rhizome with water, an opalescent distillate, of a peculiar odor, was obtained, from which a white *camphoraceous substance* separated, scaly in appearance, of a faint odor, nearly tasteless and soluble in alcohol.

POWDER FOR PRODUCING OZONE.

BY JOHN L. DAVIS.

"In order to produce artificial ozone, Mr. Lender makes use of equal parts of peroxide of manganese, permanganate of potassium and oxalic acid. When this mixture is placed in contact with water, ozone is quickly generated. For a room of medium size, two teaspoonfuls of this powder, placed in a dish and occasionally diluted with water, would be sufficient. The ozone develops itself; it disinfects the surrounding air without producing cough."

The attention of the writer was called to the above article as it appeared in the "Philadelphia Medical and Surgical Journal," under date of May 20th, 1876. For the purpose intended, it is certainly one of the best of the published formulas, but on account of the danger attending its manipulation, should be used with extreme caution. A prescription with these proportions was taken to an apothecary, who inadvertently used a mortar in mixing it, with the result of an immediate explosion; which would have been attended with disastrous consequences except for the smallness of the quantity employed.

In mixing these ingredients, trituration should not be used at all, but they should be cautiously mixed with a spatula in small quantities; and even then, if they should have been reduced to a *fine powder* they cannot be mixed without danger, as the mixture is liable to explode at the moment of contact.

Apothecaries who are not deficient in knowledge, are sometimes deficient in caution, and articles published in reliable journals are copied and used without hesitation, and the compounder or dispenser is brought into unlooked-for and unexpected difficulties.

The above article is written solely with a view of placing druggists and physicians on their guard in using or dispensing a dangerous compound.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Phosphide of Zinc, according to Vigier, is sometimes defective, containing oxide of zinc, probably in consequence of having been prepared in contact with air. It should form a very fine powder resembling iron reduced by hydrogen, easily soluble in hydrochloric acid with an abundant disengagement of phosphoretted hydrogen. Vigier and Curie propose the following formulas :

Pills of Phosphide of Zinc.—Phosphide of zinc in fine powder 0·80, liquorice powder 0·30, and gum syrup 0·90 grams ; for 100 pills, silvered. Each pill contains theoretically 2 milligrams of phosphorus, or one milligram of active phosphorus. Two to four are usually administered daily, and can be taken without other inconvenience than allicious eructations.

Phosphide of Zinc Powder.—Phosphide of zinc in fine powder 0·40, starch powder 5·00 grams. For 50 packets, each of which will contain 1 milligram of active phosphorus.—*Phar. Jour. and Trans.*, June 10, from *l'Union Phar.*, XVII, p. 41.

Phosphide of Zinc was first prepared by Marggraf in 1740. Formerly it was made by fusing, in a bath of iron filings, 74 parts of pure zinc, and adding gradually in small pieces 26 parts of dry phosphorus. This process gives good results only in small quantities (10 to 20 grams). A more recent process (probably by Regnault) is to pass vapors of phosphorus, in a current of dry hydrogen over fused zinc. The product is a spongy, gray mass, of metallic appearance, containing rhomboidal crystals, and resembling somewhat reduced iron when powdered. The metallic particles of zinc should be separated. Its spec. grav. is 4·72. When triturated a phosphorous odor is developed. It is permanent at the ordinary temperature, but at a red heat is fusible and volatile, and if in contact with air burns to zinc phosphate. It should be completely

soluble in dilute mineral acids with the evolution of phosphoretted hydrogen. It is given in doses ranging from 0.005 to 0.02 (1-13 to 1-3 grain) three or four times a day. The largest admissible dose appears to be 0.1 gram ($1\frac{1}{2}$ grains), or 0.4 gram (6 grains) per day.—*Hager in Phar. Cent. Halle*, No. 27.

The Reduction of Sulphurous Acid to Sulphur by carbon is not as perfect as was formerly supposed. P. W. Hofmann observed that sulphur is readily obtained by passing sulphurous acid gas over calcium sulphide heated to dull redness, the latter compound being oxidized to calcium sulphate (gypsum), from which the sulphide may again be easily prepared by heating it with charcoal. The sulphides of sodium, potassium and barium will answer the same purpose.—*Indust. Ztg.*, 1876, p. 65.

New Reagent for the Detection of Sulphur in Organic Compounds.—H. Vohl recommended for this purpose, in 1863, to heat the compounds with sodium and prove the presence of sodium sulphide by nitroprussid of sodium. This method, which was also recommended by Bunsen in 1866, indicates the presence of sulphur in all its combinations; but the following reagent is now recommended by Vohl as not producing a color reaction with the oxygen compounds of sulphur: A mixture of one measure of distilled water with two measures of glycerin is saturated at the boiling temperature with slaked lime, and afterwards with recently precipitated hydrate of lead, or with elutriated litharge; after cooling, the clear liquid is decanted and preserved in well-stoppered bottles from contact with carbonic acid. The reagent is used by heating it to boiling with the organic body, which is thereby colored black, if sulphur not in combination with oxygen is present. Hair, feathers, horn, albumen, albuminous urine, etc., readily indicate the presence of sulphur. The use of lime is preferable to potassa and soda, because the latter darken many organic compounds at the boiling temperature.—*Ber. Deutsch. Chem. Ges.*, 1876, p. 875-877.

Instability of sublimed salicylic acid.—J. Biel observed that sublimed salicylic acid, which was in long silky needles and entirely inodorous, acquired after a week a rose-colored tint which gradually deepened, the characteristic odor of phenol becoming likewise apparent. The presence of the latter could not be demonstrated by chemical reactions, owing to the presence of undecomposed salicylic acid, but the generation of free carbonic acid was easily proven by passing air, deprived of

all traces of this gas, through the bottle containing the salicylic acid, and through titrated baryta water. The author cautions against the use of sublimed salicylic acid, since this mild remedy decomposes spontaneously into the very caustic phenol.—*Phar. Zeitschr. f. Russl.*

Preparation of salicylic cotton wadding.—For this purpose a white wadding completely freed from fat by sodium carbonate is necessary. E. Rennard saturates in a porcelain mortar 10 parts of this wadding with a solution of 2 parts salicylic acid in 15 of alcohol and 35 of water of 25 to 30°C (77 to 86°F.). After the solution has been completely absorbed, and by means of the pistil uniformly distributed through the cotton, the latter is subjected to pressure until 25 parts of the solution are recovered, which may be used for wetting a fresh portion of cotton. If it is desired to avoid expression, only one part of salicylic acid is employed, but the full quantity of liquid mentioned above, which is about the smallest quantity with which a uniform moistening of the cotton can be effected. The wadding is then dried at ordinary temperature, since a higher heat causes a reddish color. Thiersch has recommended the addition of some glycerin, in order to fix the acid more permanently upon the cotton; but Rennard states that the addition of 10 and even 20 per cent. of glycerin will not completely prevent the dusting of the acid on beating the cotton.

The above proportions furnish a wadding impregnated with 10 per cent. of salicylic acid; this strength and a wadding containing 4 per cent. are most generally employed.—*Zeitsch. Oester. Ap. Ver.*

Diospyros fruit, known in Bombay as *timbooree*, is intensely astringent until quite ripe. It is about 1½ inches in diameter and resembles the American persimmon in properties. W. Dymock does not give the name of the species.

Entada pusaetha, local name *gardul*, is a gigantic climbing shrub, bearing legumes three feet long and 4 or 5 inches wide. The seeds, called *pilpatre*, are heart-shaped, 2 inches in diameter, with a shining brown testa, resembling that of the horse-chestnut, but 1-16th of an inch in thickness; cotyledons white, taste insipid, turns water milky. It is reputed of being emetic. In Soonda the roasted seeds are eaten.

The galls of *Rhus succedanea*, called *kakrasinghee*, are generally single, sometimes lobed, of a purse-like form and vary much in size. They come from Northern India, resemble Chinese galls and have a purely astringent taste.—*Phar. Jour. and Trans.*, June 17.

Oil of Orris.—Prof. Flückiger has examined the solid oil which is prepared in Europe from orris-root by distillation. By repeated crystallization from alcohol and treatment with animal charcoal, inodorous crystals were obtained, having the composition ($C_{14}H_{28}O_2$) and properties of myristic acid, while the odorous principle remained in the mother liquor, so that oil of orris must be regarded as myristic acid, impregnated with some volatile oil. The acid does not pre-exist in orris-root, and is probably liberated from a fat by the influence of steam.—*Archiv d. Phar.*, June.

The behavior of castor oil to petroleum benzin was observed by Hager eight years ago, and recently subjected to further experiments. After agitating one volume of castor oil with two of petroleum benzin and setting the mixture aside, it separates after several hours in two layers, the heavier of which occupies 1.6 vol. at 16°C. (60.8°F.) and 1.75 vol. at 10°C. (50°F.), while the upper layer is benzin, containing about 1-30th of castor oil in solution. In the presence of other fixed oils, the behavior is different: if the admixture is small the heavier stratum will be reduced in volume to 1 or 1.2, and to about 0.4 if the admixture amounts to 25 per cent. In the presence of still larger quantities complete solution takes place. The nature of the fixed oil, however, exerts some influence so that the amount of adulteration cannot be estimated from the volume of the heavier stratum. At a temperature of 40°C. (104°F.) separation into three strata takes place.

Pure Benzol, having a boiling point of 80–85°C. (176–185°F.) dissolves castor oil in all proportions.

Alcohol of 90 per cent. yields clear mixtures with castor oil in all proportions at 25°C. (77°F.), but from 3 to 5 volumes are required at 15 to 18°C. In the presence of other fixed oils, much larger quantities of alcohol will not yield clear solutions; but with 2 vol. alcohol on standing, separation into three strata takes place, the lowest of which is usually the foreign oil, the second one castor oil containing alcohol, and the upper layer alcohol containing castor oil in solution.

On cooling a warm solution of castor oil in alcohol, three layers are often formed, the lowest containing mainly stearin and the second chiefly olein.—*Pb. Cent. Halle*, No. 7, 8.

Aeterpen (abbreviated from æthyl terpen) is the name of a new compound, given by V. Meyer and F. V. Spitzer to a body obtained by them in their investigations on the constitution of the terpens, $C_{10}H_{16}$,

which, according to recent investigations, are closely related to cymol, $C_{10}H_{14}$. The authors prepared Pfaundler's monochlor-terpen by reacting upon camphor with pentachloride of phosphorus, according to the equation, $C_{10}H_{16}O + PCl_5 = POCl_3 + HCl + C_{10}H_{15}Cl$. A solution of the chlorinated terpen and of ethyl iodide in pure benzol was added to sodium kept under benzol and the mixture heated in a water bath, the flask being connected with a reversed condenser. By repeated fractional distillation and cooling the fractions with ice, crystals were obtained, which were further purified by expression and recrystallization from ether, when they constitute pure æterpen, $C_{12}H_{20}$, formed as follows: $C_{10}H_{15}Cl + IC_2H_5 + Na_2 = NaCl + NaI + C_{10}H_{15} - - - C_2H_5$. In appearance, and even in odor, the new compound resembles camphor, but has about the consistency of wax; it fuses at $63.5^\circ C.$ ($146.3^\circ F.$), boils without decomposition at $153^\circ C.$ ($307.4^\circ F.$ —uncorrected) and volatilizes readily at ordinary temperature. It is insoluble in water, but very soluble in ether, benzol, etc.

The other products of decomposition have not yet been examined. —*Ber. d. d. Chem. Ges.*, 1876, 877-880.

Extract of Malt with Quinia.—Hager recommends to discard the use of quinia sulphate in this preparation, which thereby acquires a bitter taste. This is avoided if quinia tannate, prepared by Rozsnyay's method ("*Amer. Jour. Phar.*," 1875, p. 268), is used. One part of the tannate, dissolved in 100 parts of neutral extract of malt, alters neither the taste nor color of the latter, and does not separate any sediment. After diluting it, a slight bitter taste is produced in a day.

For ferrated extract of malt an improvement on the formula of the German "*Pharmacopœia*" ("*Am. Jour. Phar.*," 1873, 109) is recommended, whereby the taste is not affected. Three parts of iron saccharate (*ibid.*, p. 161) are rubbed up with seven parts of glycerin and mixed with ninety parts of extract of malt.

Iodinized extract of malt is made by dissolving 0.01 potassium iodide in 100 of malt extract.

Pepsinated Extract of Malt.—Two parts of saccharated pepsin are triturated with five of glycerin and dissolved in ninety-three of the extract. This preparation is probably best made extemporaneously, since the taste is modified after awhile, without, however, becoming disagreeable.

Extract of malt with hops may, perhaps, be made by dissolving one

part of alcoholic extract of hops in 200 parts of malt extract. (Fluid extract of lupulin may be advantageously used.—Editor.)

Syrup of malt is an unstable, unnecessary preparation, made by mixing one part of malt extract with nine of simple syrup.—*Phar. Cent. Halle*, No. 24.

The constituents of ergot of rye, according to Prof. Dragenдорff and M. Padwiositzky, are, 1, *scleromucin*, a colloidal substance, containing nitrogen, but giving no albuminoid, alkaloidal or glucosidal reaction, insoluble in 45 per cent. alcohol, and after drying only partially soluble in water; 2, *sclerotic acid*, soluble in 45 and in boiling 75 per cent. alcohol, colloidal in the pure state, containing nitrogen; 3, *sclererythrin*, a red coloring matter, soluble in alcohol, ether, chloroform and caustic alkalies (in the latter with a murexid color), but in combination with lime insoluble in water and alcohol, probably a derivative of anthraquinon; 4, *scleroiodin*, a coloring matter insoluble in alcohol, ether, chloroform and water, soluble in potassa solution, with a splendid violet color; 5, *sclerocrystallin*, crystallizing in needles, soluble in chloroform, with difficulty in ether, insoluble in water and alcohol, formula probably $C_{10}H_{10}O_4$; 6, *scleroxanthin*, a hydrated compound of the preceding, yellow and crystalline; 7, another *yellow coloring matter*, amorphous; 8, *brownish resin*; 9, *Wenzell's alkaloids* ("Am. Jour. Phar.," 1864, p. 193), probably identical with each other, inactive upon frogs.

The most active of these compounds is sclerotic acid, which has been successfully used by Prof. von Holst in doses of 0.04 to 0.05 grams injected subcutaneously. Sclererythrin and scleroiodin have a slight action upon frogs. *Tanret's ergotin* is not a chemically distinct compound; its action upon frogs and the color reaction with sulphuric acid depend upon the presence of sclererythrin.—*Phar. Jour. and Trans.*, June 17.

Ergotin.—The researches of Professor Salkowski and other German chemists on the active principle in the preparation of ergotin were recently referred to. Professor Buchheim now writes to the *Klinische Wochenschrift* confessing that he also has not succeeded in isolating completely that principle, though he worked on it for several months; and he states his reasons why he thinks that such isolation might be impossible, and that for practical medical purposes the infusion of ergot, or the freshly prepared extract, will alone remain available.

The organization of the ergot fungus seems to him so low that its mycelium cannot build up organic matter, so as to constitute an alkaloid or glucoside substance from water, carbonic acid and ammonia, but feeds, so to speak, more directly on the vegetable material of the mother plant. He believes that less elementary compounds are taken up by it from the rye grain, and thinks the gluten the most likely material from which to form the gelatin-like substance which he isolated partly from ergotin. On this modified albuminous constituent of the rye, at a certain stage of its metamorphosis, he infers, depends the peculiar action of the fresh infusion or extract. Any further complex chemical processes and reactions for the isolation of the active substance must necessarily have changed it so much in its natural course of decomposition that it has lost its efficacy, in the same manner, for instance, as the decomposing albuminous substances of putrid blood lose their poisonous effects when decomposition has reached to a certain point.

The freshly prepared ergotin seems therefore to give alone a guarantee of success. For subcutaneous application it ought to be carefully neutralized by carbonate of soda, as it contains much acid, especially lactic acid, as Buchheim found, besides quantities of leucin.—*Phar. Jour. and Trans.*, July 1st.

Remedy for Dandruff.—A French physician recommends to apply a solution of chloral hydrate containing 5 per cent. of the latter, by rubbing from $\frac{1}{2}$ to 1 oz. into the scalp by means of a sponge, and repeating it every morning. A slight burning sensation and reddening of the scalp occurs, disappearing after two minutes. If the hair had fallen off in consequence of the dandruff, it will be renewed in about a month.—*Apoth. Zig.*, No. 25.

Fluid Extract of Chestnut Leaves made from the European variety of *Castanea vesca*, appears to be gaining favor in Germany as a remedy for whooping cough. In "*Phar. Zeitung*," of July 26, Dr. Schmidt, of Edenkoben, publishes a long list of German towns and cities where it has been employed, also extracts from numerous letters from physicians and pharmacists, according to which the preparation, though not a specific against the disease mentioned, is regarded as a very valuable medicine, usually relieving in a short time the spasmodic and paroxysmal cough and correcting the expectoration; it has also been found advantageous in the diarrhoea of children.

A New Acid in Mare's Milk has been discovered by Dr. Duval, which is not found in the milk of ruminants, at least not in appreciable quantity. It crystallizes in scale-like needles, is not volatile without decomposition, has a pungent odor and a peculiar taste. It is combined in the milk with a volatile base which evaporates on being heated. It has been named *equinic acid*.—*Chem. Centralbl.*

Preparation of Pure Grape Sugar.—For this purpose C. Neubauer recommends the process of Schwarz (1872). 500 to 600 cc. of 80 per cent. alcohol are mixed with 30 to 40 cc. of fuming muriatic acid, and powdered cane sugar, is dissolved in this mixture to saturation. Large quantities of grape sugar crystallize on standing in wart-like masses, which merely require washing with alcohol and recrystallization from boiling absolute alcohol. The acid mother liquor may be again saturated with cane sugar and used as before.—*Zeitschr. Anal. Chem.*

Impure Persian Opium.—Barnard Proctor recently analyzed a sample of Persian opium from which he obtained only 0.25 per cent. of morphia.—*Phar. Jour. and Trans.*, June 24.

On the Action of Sulphuretted Hydrogen upon Alkaloids.—E. Schmidt observed (1875) that an alcoholic solution of *strychnia*, after saturation with H_2S and exposure to the air separates orange-red crystals, which were found to be $2C_{21}H_{22}N_2O_2$, $3H_2S_2$, and from which mineral acids separated a heavy oily body (most likely H_2S_2) evolving H_2S_2 in a few days.

Under the same circumstances *brucia* yields yellow needles, having the composition $C_{23}H_{28}N_2O_4$, H_2S_2 , and by a slight modification, ruby red crystals containing an additional molecule of H_2S_2 .

Quinia, cinchonia, cinchonidia, quinidia, morphia, codeia, papaverina, narcotia, thebaina, atropia, veratria, conia and nicotia acquire under similar circumstances an intense yellow coloration; but well characterized compounds have as yet not been obtained. Coffeina and theobromina appear not to be affected by this treatment.—*Archiv d. Phar.*, June, 478-496.

NOTE ON SO-CALLED WOOD OIL.

BY PROF. F. A. FLÜCKIGER.

In a note communicated to the "Archiv der Pharmacie," for May, the author states that he has found that the etherial oil of *Dipterocarpus balsam*, known as Gurgun balsam or wood oil, when dissolved in

about 20 parts carbon bisulphide, and a drop of a cooled mixture of equal parts of sulphuric and nitric acids added, takes a splendid violet color. A single drop of the ethereal oil is sufficient to produce the reaction, and the color lasts several hours. It is not prevented by the presence of resin or by copaiva balsam, so that the reaction takes place with the crude Gurgun balsam, or even when that is mixed with eight times its volume of copaiva balsam. The reaction can, therefore, be used to detect the presence of Gurgun balsam in copaiva balsam. Under the same conditions fish liver and oil of valerian are also colored a beautiful violet, but only transiently so. In order to exclude fish oil from the test, it is recommended to distil off the ethereal oil, although on account of its high boiling point (250° to 260° C.) this is not an agreeable task. Only a few drops are required, however, for the test.

Should a wood oil not correspond to this reaction, the author thinks it might probably be due to the fact that some *Dipterocarpus* trees yield a varying balsam. The balsam is obtained in large quantities from the following species: *Dipterocarpus turbinatus*, Gaertn. (syn. *D. lævis*, Ham., *D. indicus*, Bedd.), *D. incanus*, Roxb., *D. zeylanicus*, Thw., *D. trinervis*, Blume, *D. littoralis*, Bl., *D. alatus*, Roxb., *D. hispidus*, Thw., *D. gracilis*, Bl., *D. retusus*, Bl. All these species occur in India and in the Archipelago, and the last even in the Philippines. Their resinous juice is used very generally as varnish, hence the name "wood oil." It is hardly probable that they all yield a resin chemically and physically identical. The author has found that the oil distilled by him from undoubtedly true *Dipterocarpus* balsam is dextrogyre, whilst Werner, who first examined Gurgun balsam, in 1862, speaks of it as lævogyre. In all the specimens examined by the author to the present time, however, he has found the color reaction constant.

Another possible ground for failure in obtaining the reaction is its confusion with other liquids used for similar purposes. The balsam obtained from *Hardwickia pinnata*, Roxb., a leguminaceous plant, is used in Southern India in the same medical cases as copaiva balsam; but an authentic specimen in the author's possession is not fluorescent like *Dipterocarpus* balsam, and dissolved in carbon bisulphide gives only a yellow color with the acid mixture. The author does not know, however, that it is ever there called "wood oil."

A fat oil, used in enormous quantities in Eastern Asia for paint and varnish, and also as a drastic medicine, and very generally called "wood

oil," is obtained from the seeds of *Aleurites cordata*, Muller (syn. *Dryandra cordata*, *Thunb.*, *Elaeococca Vernicia*, *Sprgl.*, *E. verrucosa*, *A. Fuss.*), a euphorbiaceous tree. The tree is common in China and Japan, of very characteristic appearance, and is known in China as the "tung tree." The oils from the seeds of *Ricinus* and *Croton Tiglium* differ in chemical properties and physiological action from most known oils; how far such peculiarities occur principally in the Euphorbiaceæ is a question that yet requires answering.

That the "wood oil" from the Tung tree is a fat worthy of notice is shown by the experiments of Cloez. This chemist obtained from the seeds of *Aleurites cordata*, by means of carbon bisulphide, 41 per cent. of a fixed oil, forming a solid crystalline mass below 32°C. When on the contrary the seeds were treated with ether an oil was obtained that did not solidify even at 18°C. But what is most surprising is that when prepared either by pressure or by one of the solvents mentioned, and heated in the air to 200°C., it changes suddenly into a solid transparent jelly, which is no longer soluble in ether or carbon bisulphide.¹ This change takes place also after a few days, when excluded from the air, under the influence of light alone. The oil dries more rapidly than linseed oil. The principal acid in it was obtained in crystals that melted at 44°, but very rapidly resinified, and therefore did not consist of linoleic acid.

In many respects this Chinese wood oil recalls the singular "axin" or "age" of Mexico, examined by Hoppe-Seyler, in 1860.² The Nin fat of Yucatan, described by Dondé,³ might also be mentioned here. All these oils appear to correspond in yielding a peculiar body, which Mulder describes as linoxyn.—*Pharm. Jour. and Trans.*, July 1, 1876.

NOTES ON THE INTERNATIONAL EXPOSITION.

BY THE EDITOR.

IV.

Among the most important staple articles in the line of crude drugs is *opium*, which is very well represented at the Exposition in its various commercial varieties, as well as in some samples showing the result of the experimental culture of the poppy.

¹ "Comptes Rendus," Sept. 1875, p. 469, and 1876, p. 501.

² Gmelin, vol. vii., p. 1471.

³ "Pharm. Journ.," [3], iv., 836.

The species of poppy cultivated for the production of opium is *Papaver somniferum*, *Lin.*, of which there are a number of races, the most important of which are the varieties *rigrum* (*glabrum*, Boissier) and *album*. The former of these has usually deep-purple colored petals, varying, however, to almost completely white, and bears seeds which, though usually blackish-blue, vary likewise in shade to a pale yellow. The second variety has the flowers and seeds almost always white, or nearly so. But the most distinctive character between the two varieties is the capsule, which in the black poppy is always subglobular and occasionally depressed or at the base even concave; the capsule opens by pores, which are of the same number as the rays of the closely sessile stigma. The capsule of the white poppy is ovate-globose to oblong and indehiscent.

The collection of the opium takes place after the falling of the petals and before the ripening of the seeds. The capsules are then scarified by means of a one- or several-bladed knife, arranged in such a manner that it cannot penetrate through the capsular wall, which would occasion the loss of the milk juice. The incisions are made either longitudinally or transversely, and the exuding juice is scraped from the capsule on the following morning, by which time it has become sufficiently firm and its color has changed from white to brown. Afterwards it is worked up into cakes, which, in the different countries vary not only in consistence but likewise in shape, size and the material in which they are packed for the market, or which is employed to guard against the cakes adhering together.

The variety of opium which is found in the commerce of the United States is obtained from Turkey, and usually called Smyrna or Turkey opium; it is produced from the black variety of poppy, the incisions being made transversely, or rather somewhat spirally; the collected juice is mixed and formed into globular cakes, each of which is wrapped into one or sometimes two poppy leaves, and when sufficiently dry, is packed at first into bags and subsequently, for exportation, into boxes, a sufficient quantity of chaff, consisting of the calyx of a species of *Rumex*, intermixed with the triangular fruit being added to prevent the cakes from running together. The Ottoman government exhibits 12 cakes of opium, varying in weight from a few ounces to over a pound, which represent the style in which this drug is prepared in different localities. Larger samples of Turkey opium, both from Asia Minor and the European provinces, are shown, in large, handsome bottles, by H. A. Holstein, Constantinople, and represent the towns and districts of Angora, Beibasar, Geiwe, Konia, Mualitsch, Kiutahia, Saloniki, Seardo, Siwrihissar and Tanchanly.

The opium exhibited by the National Museum of Egypt resembles the former; the cakes shown vary in size, are rather flattened and show the remnants of the poppy leaves in which they have been enveloped; but fragments of *Rumex* chaff are not observed. The cultivation of opium in Egypt, which was carried on quite extensively about 50 years ago, was subsequently much neglected, but through the experiments and exertions of Gastinel Bey, director of the botanical garden at Cairo, has during the last decade considerably increased, the quantity raised being, however, still insufficient for home consumption, although Egyptian opium may be found in the European market. It is very rarely imported into this country. The capsules exhibited vary somewhat in shape, one lot being depressed globose in shape,

while another is ovate, all having white seeds. The incisions appear to be mostly made with a single knife blade; they are horizontal or somewhat spiral, several being made on different parts of the fruit.

A variety of opium which has become of considerable importance of late years is that produced in Persia, which country is not directly represented at this Exposition; but various samples of its opium are shown by Rosengarten & Sons and Powers & Weightman. The former firm exhibit Persian opium in balls, each one wrapped separately in thin white paper; the latter firm show a large quantity of it in the form of globular cakes, the original shape being considerably modified by mutual pressure, all packed in so-called poppy trash. This opium is said to be principally derived from the white poppy by longitudinal incisions; in collecting the hardened juice, the scraper is occasionally dipped into oil to prevent the opium from adhering; some of the oil becomes mixed with the juice, and the opium has, therefore, a greasy appearance, the oil often exuding in drops when a cake is cut. Persian opium is also formed into short cones and into cylindrical sticks, which are wrapped in paper. It is much more variable in morphia strength and in the amount of matter soluble in water, than Smyrna opium, and this is due, partly at least, to the various admixtures, purposely made for the purpose of moulding it into a peculiar shape, or of obtaining certain preparations in which forms it is popularly employed in that country. It is not met with in this country in the open market, its importation being permitted only with the view of employing it in the manufacture of morphia and the other alkaloids.

East India opium is represented only by two specimens from the India museum, consisting of a broken round cake of Behar opium, and of a ball of so-called "provision opium," which is prepared for exportation to China; the two represent the principal kinds manufactured under the strict supervision of the Indian government. The white poppy is cultivated in India, the capsules exhibited being globular ovate, and bearing the marks of vertical incisions with a three or four-bladed knife. The petals are carefully collected after they have become sufficiently matured to be readily removed together by slight pulling, and the capsules are scarified vertically with a several-bladed knife, called *nushtur*. The petals are carefully preserved and assorted, and afterwards serve for the formation of the covering of provision opium, which is effected by forming *leaves* from the petals in a shallow earthen dish, sufficiently heated to render them glutinous, and afterwards agglutinating these leaves, so as to form a shell about $\frac{3}{8}$ inch thick, in a hemispherical brass mould, by means of *lewah*, which is a kind of paste made by diffusing opium in the *washings* or *dhool* (water which had been previously used for cleaning the opium vessels), and, in order to render it more glutinous, adding a certain portion of *pussewah* or *passerwa* (drainings from the recently collected poppy juice). When the opium has attained the standard quality of 70°, *i. e.*, contains 70 per cent. of dry opium and 30 per cent. of moisture, 1 seers 7.5 chittaks (3 lbs.) are weighed out, carefully placed into the shell and formed into a ball, the upper half of which is covered by the ends of the shell, strengthened with some leaves and agglutinated by lewah, after which the *cakes* are rolled in *poppytrash* (the dried plant ground). The finished ball weighs, fresh, a little over 2 seers 1 chitt. (not quite 4½ lbs.), and when dry 2 seers, or about 4 lbs. avoirdupois. The drying requires much care, to prevent the opium from

spoiling, and the cakes are finally packed in boxes divided into 40 compartments, each of which receives one ball, in which state it is exported, principally to China. The opium used in the East Indies is prepared differently, the juice being evaporated in the sun, when it is formed into square or round cakes; the Behar opium on exhibition is of this kind.

Although the cultivation of the poppy for opium has been repeatedly prohibited in China (*"Amer. Jour. Phar.,"* 1869, p. 477), and the prohibitory decree has never been repealed, it appears to have steadily increased, being carried on under the eyes, if not with the full knowledge of the authorities. There are two varieties of Chinese opium, coming from two ports. The sample which represents the opium met with at the northern port of Newchwang, is a cake of about the size of a fist, somewhat flattish globular in shape, rather firm in consistence, light-brown in color, and of a good opium odor. The cake is wrapped in thin, white paper and is greasy, perhaps rather less than the Persian opium which it closely resembles. It has the appearance of being dried without the aid of artificial heat.

The second variety comes from the port of Hankow, and consists of pieces of a larger cake, which apparently was originally nearly spherical, or perhaps, cylindrical, is wrapped in white paper, and shows on the outside remnants of vegetable tissue, but no impressions or remnants of leafvenation; there can be no doubt of its being identical with the Hankow opium described by Dr. R. A. Jamieson a few years ago (see *"Pharmacographia,"* p. 51). It is firm externally, and of a dirty, yellowish color from the adhering tissue, internally of a deep black-brown, quite soft, and of a good opium odor. Having an extract-like appearance, it is not unlikely that heat is employed in evaporating the milk juice, but no empyrematic odor is observable.

The poppy cultivated in China is not exhibited, but it is not too much to assume that it is the same variety which is employed in India and also in Japan, namely the white, and that the capsule is incised longitudinally. Chinese opium is reported to be inferior to the Indian; but we are not aware of any comparative assays.

Japan has also sent opium as the produce of her soil. The scarified poppy capsules, which are likewise on exhibition, show that the white poppy is here cultivated for this purpose; they differ from the white capsules as ordinarily seen in being narrow oblong in shape. Several incisions are made vertically, and the opium, which is in thin, flattened cakes wrapped in paper, is of a dark-brown color, but of good quality as far as odor and taste are concerned. We could get no information regarding the extent of cultivation, nor do we know of a morphimetric assay of this product.

With the above, the varieties of opium, which are important either for home consumption or in a commercial aspect, have been all enumerated; but several samples are likewise on exhibition which prove that a good medicinal opium can be obtained also in other countries. The sample of opium which was raised in Victoria and sent by Mr. Joseph Bosisto, was unfortunately lost on the voyage; according to his statement, it contained 10 per cent. of morphia, a sample of which, made from the former, has reached here. The poppy capsules have likewise been lost, so that we have no information as to the variety cultivated or the manner in which the capsule was treated.

L. Mengers has on exhibition in the Spanish department several flat cakes of opium wrapped in poppy leaves, and to all appearance of good quality. The opium shown by Fr. Jobst, of Stuttgart, is of good and even excellent quality—the sample produced in Silesia containing 8 to 9 per cent. of morphia, while that raised in Wurttemberg is marked to contain between 12 and 15 per cent. of that alkaloid. The collective exhibit of the Central Pacific Railroad contains specimens of the white-seeded poppy; it is known that a good quality of opium may be produced in California ("Amer. Jour. Phar.," 1874, p. 105), but there has been but little attention paid to it as yet.

As might have been expected, the exhibition of the various constituents of opium which are used in medicine is quite extensive, though the samples are, in the majority of cases, small and insignificant, and in no way indicating the importance of the articles for the respective countries. Naturally the United States are well represented, and we are pleased to say that the goods are creditable not only in regard to quantity but also to quality. The American exhibitors have confined themselves almost altogether to the commercial medicinal chemicals; hence we find here besides *meconin* merely the alkaloids *morphia*, *codeia* and *narcotina* in their uncombined state, and particularly the first one in several of its saline combinations, among which the hydrobromate and valerianate of morphia may be mentioned, the first one as having been recently introduced into medicine, the last one on account of its superior appearance, as compared with some samples of a decidedly brown color, met with in the exhibits of two or three other countries. The large, handsome crystals of codeia also deserve special notice, likewise the splendid exhibit in bulk of 700 ounces of sulphate of morphia by Powers & Weightman; the last crystallization of this salt, instead of being broken up in the manner in which it is seen in commerce, has been simply cut up into rectangular bricks which are piled up in one large glass case.

The results of original investigations with opium are met with in the exhibits of T. & H. Smith, of Edinburgh, and of Fr. Jobst; quite a large number of new opium alkaloids have emanated from the latter laboratory, the discoveries of O. Hesse, (see "Amer. Jour. Phar." 1870 p. 394, 1875, p. 447; "Proc. Amer. Phar. Asso.," 1873, p. 373); but of the long list *laudania* is the only one exhibited, besides the older alkaloids thebaine, pseudomorpha, and morphia, with some of the salts of the latter ordinarily met with.

A more extensive exhibit of the constituents of opium is made by T. & H. Smith, who besides most of the opium derivatives already mentioned, show bimeconate of morphia, hydrochlorate of narcotina, papaverina as alkaloid and hydrochlorate, narceina, cryptopia, ("Amer. Jour. Phar.," 1867, p. 421), Hesse's rhœagenina (*Ibid.*, p. 123), crystallized meconic acid and thebolactic acid, discovered by the manufacturers (*Ibid.*, 1865, p. 466). The latter nearly colorless liquid is shown in a large glass jar, and the cryptopia in considerable quantity, considering its limited occurrence, in handsome, well-defined crystals as well as in the form of a mass of cauliflower appearance and evidently the result of drying the gelatinous mass which under certain circumstances is formed by the alkaloid and its salts. Several of the opium constituents are presented in the condition in which they have been crystallized in an evaporating dish, the mother liquor having been poured off. Altogether we

regard this as the most interesting and instructive exhibition of the chemistry of opium, on account of the variety of compounds, the number of rare preparations and the results of original investigations.

More limited in the countries of production is *camphor*, which is furnished by the laurel *Camphora officinarum*, Bauh., a stately tree of Japan and the eastern portion of Asia, where it is obtained by subjecting the cut branches and wood to a crude distillation in the presence of water; after draining it in vessels having a perforated bottom, it is met with in the market as Chinese and Japanese camphor, which varieties are exhibited in their proper departments. The former, or Formosa camphor, is usually of a light-brown or grey color, the latter is nearly white, or somewhat pinkish, and both occur in their crude state in the form of small grains. The refining of the crude article appears to be carried on in Europe still in peculiar-shaped glass flasks, which require to be broken in order to obtain the cake of sublimed camphor. Of late years the refining of camphor has become quite an industry in the United States, where it is effected in vessels constructed for the purpose, having a movable lid, upon which the sublimate condenses; with this arrangement the expense of a glass vessel for each cake is saved.

Crude camphor is exhibited by China and Japan as one of their staple articles, and in the department of the latter country is also found some refined camphor in large fragments, apparently broken from larger cakes. Circular cakes of the refined article, with the accustomed circular hole in the center, are exhibited by Chas. Pfizer & Co., of New York, and Kurlbaum & Co., of Philadelphia, the last-named firm collecting also the volatile oil with which the crude camphor is always more or less impregnated, and which is lost in the old method of purification; like the Formosa oil of camphor with which it is identical, it contains variable quantities of camphor in solution.

Camphor, as is well known, is extensively employed for protecting clothes from the ravages of moths; the crystalline cakes, in which it is usually met with, contain many fissures, from which the volatilization of the camphor proceeds, the same as from the surface. It is obvious, that with a decrease of the entire space presented to the air, the rapidity of evaporation must necessarily be lessened, while its effectiveness must remain the same if, through the slower evaporation, the confined atmosphere may still be kept saturated with camphor. This idea is carried out in the *compressed camphor*, manufactured and exhibited by W. F. Simes & Son. This firm distil crude Japanese camphor slowly from a suitable retort, and carry the vapors into a large chamber, where it condenses in the form of a very fine crystalline powder, which is afterwards compressed by hydraulic pressure into rectangular blocks of a definite weight. These blocks may also be made directly from the crude camphor, and then contain also the small percentage of impurities naturally found therein.

Among the chemical derivatives of camphor we notice crystallized *camphoric acid*, in the interesting and instructive exhibit of H. Trommsdorff, Erfurt, and *monobromated camphor*, by most of the manufacturers of medicinal chemicals of the United States, Germany and some other countries. If we are permitted to judge from the number of exhibitors in the various departments, and from the quantities exhibited, this compound has everywhere rapidly gained the confidence of physicians, and become a n

important remedy since it was first recommended by Prof. Deneffe, a few years ago. Although all the samples on exhibition are evidently pure and nicely crystallized, yet, in our opinion, decidedly the handsomest and largest crystals are shown by Hance Bros. & White, Philadelphia, who have on exhibition 38 lbs. of this compound, the result of one crystallization. We are informed that this firm employ essentially the process published in this journal 1872, p. 342, allowing the heat to rise to 270°F. (132°C.) and even 280° F. (138°C.), and that other processes, which were published more recently, did not yield such favorable results. These observations made on a large scale coincide, therefore, with the experiment of F. C. Linthicum (see August number, p. 346). The crop of crystals exhibited by the firm mentioned, was obtained from petroleum benzin.

THE CHEMICAL INDUSTRY OF GERMANY AT THE CENTEN- NIAL EXHIBITION IN PHILADELPHIA.

BY THE COMMITTEE OF THE ASSOCIATED GERMAN CHEMICAL MANUFACTURERS.

I. *Technical-chemical and Pharmaceutical-chemical Substances and Fertilizing Agents.*

This class comprises the more prominent branches of the chemical major-industry.

Leblanc's *soda* process, in spite of the many not unimportant researches concerning it, has, chemically speaking, experienced no important modification. In the construction of the ovens employed, however, an improvement has been effected,—the principle so much applied in iron technology, of a revolving oven, having here found application. Of the many proposed new methods for the transposition of the salt into soda, only the so-called ammonia-soda process has been able to procure itself an introduction into chemical industry. In spite of all doubt concerning the profitableness of the method, it is a fact that at the present moment the soda so produced can, as excellent 98 per cent. article, compete with the Leblanc soda.

But seldom do statistics reveal to us such a great success and such a profound revolution of an industry as the utilization of the Stassfurt and Leopold Hall waste salts have occasioned in the *potash industry*. Although an offspring of most modern date—hardly ten years old—the decomposition and utilization of these salts have as well as superceded all other methods of producing potash salts.

Corresponding to this colossal production, there are employed in this branch of industry besides 1,100 miners in the two mines, on the average, 3,000 workmen.

In 1872 were produced:

Potassium chloride in various degrees of strength, 80 per cent., 90 per cent., 95 per cent. and 98 per cent., about 132,000,000 lbs.

Potassium sulphate, by double decomposition of potassium chloride and magnesium sulphate, about 2,750,000 lbs.; *Potassium carbonate* (potashes) about the same amount. *Magnesium sulphate*, raw and crystallized, about 22,000,000 lbs. *Sodium sulphate*, crystallized and calcined, about 13,300,000 lbs. *Magnesium chloride*, crystallized and fused, about 11,000,000 lbs. *Boracic acid*, about 26,400 lbs. *Bromine and bromine preparations*, about 77,000 lbs. *Artificial bath-salts*, about 220,000 lbs. *Potash manures*, in various grades, about 110,000,000 lbs.

A not inconsiderable part in the increase of the Stassfurt and Leopold Hall industry is taken by the utilization of the potash salts as manures.

About 30 per cent. of the total production of the Stassfurt industry is consumed at home, while about 70 per cent. is exported especially to England, France, Belgium, and the United States, etc.,— a striking proof of the importance of this branch of industry for foreign countries.

While not twenty years ago the entire amount of potashes coming into commerce was made from the ashes of plants containing potash,—whole forests falling martyrs to this mode of production,—we are now indebted to the disclosure of the Stassfurt potash industry for a new and advantageous process of manufacturing the potassium carbonate, so necessary in many branches of industry. This process, as already mentioned, seems qualified to place all other methods in the back-ground, and the more so, as the potashes won from potassium sulphate, and containing 92 per cent. of pure salt, are by far purer than all other potashes which come in the market. Of the 105,600,000 lbs. total produce, 55,000,000 lbs. are made from potassium sulphate.

A considerable part of the hydrochloric acid appearing as by-product in the Leblanc's soda process is used in the preparation of *chlorine*, which, as chloride of lime, is brought to a solid form, or is utilized in the manufacturing of potassium chlorate. While the home production of chloride of lime has not become equal to the English, and considerable amounts are yet imported, the manufacture of chlorate of potash is of equal birth and is not only able to compete with the English product, but has, far more, as well as superseded it.

The utilization of the manganese lyes naturally plays an extraordinarily important rôle in the profitableness of the chlorine products, and it cannot be denied that Germany is somewhat behind other countries in that respect. The Weldon-method, used for this purpose (precipitation of neutralized manganese-lyes by lime, and oxidation of the obtained pap by pressing air through it), is very generally extended in England, while in Germany but few manufacturers have adopted it. In a similar manner, although from another point of view, the Deacon process, dispensing entirely with the use of manganite and depending chiefly on the decomposition of copper oxychloride at a high temperature by leading steam, air and hydrochloric acid over it, has, as yet, found no important introduction into Germany.

The *bromine* production at Stassfurt has suffered a sensible injury by the large importation of American bromine into Germany, and can only with difficulty be restored to its former importance.

The chief source of the *ammonia* production, which is worked up as aqueous solution as well as sulphate, carbonate and chloride, is the ammoniacal water of the gas-works. The sulphate has already procured itself an introduction as a manure, while a greater demand for caustic ammonia and the carbonate, occasioned by the influence of many new branches of industry, as for example, the Carré ammonia-soda method of manufacturing ice, is to be predicted.

While formerly only the native sulphur formed the raw material for the production of *sulphuric acid*, to be later superseded by pyrites, we see to-day a whole series of other materials being utilized in the manufacture of sulphuric acid. The great majority of the larger metallurgical works, yielding to the force of circumstances.

and, in most cases, to the influence of Boards of Health, have taken up the utilization of the sulphurous acid formerly escaping in enormous quantities into the air. The residues from the Laming-mixture of the gas-works, containing large amounts of sulphur, and the sulphur obtained from the soda residues are also utilized with advantage in the manufacture of sulphuric acid. The ordinary pyrites ovens being utterly inapplicable to the burning of these substances, it has been sought to construct suitable ovens for this purpose, and it is especially in this field that German technologists have introduced important improvements.

The introduction of the Glover-tower, first used in England, into the German sulphuric acid manufacture, marks a further progress. The use of the same allows not only of a greater saving in the employment of nitric acid, but renders it possible to apply the heat of the hot sulphurous acid from the washing-ovens to concentration of the sulphuric acid.

From the remaining chemical-technological products of the major-industry there remain to be mentioned, *nitric acid*, *yellow prussiate of potash*, *alum*, *aluminium sulphate*, *acetic acid* and *oxalic acid*.

The *nitric acid* has found increased application by its use in the manufacture of anilin and alizarin-colors, as well as by the increased production of sulphuric acid, nitro-glycerin, and gun-cotton. Of the salts of this acid, the potassium compound is by far the most important. It is made in Germany almost entirely by decomposition of sodium nitrate with potassium chloride.

The *yellow prussiate of potash*, the starting point of the other cyanogen compounds, finds manifold application as such in the production of blue colors or, in the form of potassium cyanide, in the most various branches of industry. The use of Berlin-blue having become, however, confined, the manufacture of the yellow prussiate of potash, in Germany especially, since animal refuse, owing to the increased demand for manures, has risen in price, has made but little progress. The many attempts to produce the nitrogen of the cyanogen compounds from other than animal sources have as yet not given results of practical value.

The manufacture of *alum* and *aluminium sulphate*, which have an extended application in dyeing, cloth-printing and tawing, as well as in paper-making, has remained as well as unchanged, except that ammonia has been substituted in the alum in place of the potash.

Oxalic acid, which a few years ago was almost entirely an English monopoly, has lately become the object of an extended manufacture in Germany. The oxalic acid produced in Germany leaves nothing to be desired as regards its quality, and can confidently compete with the English product.

The oxidation of alcohol on the one side and the distillation of wood on the other, remain the methods for the wholesale manufacture of *acetic acid* and the many salts of it, finding application in technology.

For the production of *lead acetate*, the acetic acid from alcohol is used almost exclusively, as the latter, when intended for this branch of industry, enjoys indemnity from duty, and hence, without difficulty, can compete with the pyroligneous acid. It is different, however, with the other acetic acid preparations, in whose production the alcohol employed is not free from duty. The present unusually low price of alcohol alone renders it possible to maintain a competition with the acetic acid products made from pyroligneous acid.

The large portion of *pyroligneous acid* is indebted to the very important extension of the industries connected with the distillation of wood. The large consumption of methyl-alcohol by the anilin-color works, and the constantly increasing demands for acetic acid and its salts by the technical industries have occasioned the utilization of the relatively large forests of Germany to appear all at once so very profitable in this respect that such works have sprung up like mushrooms. On account of the decrease in anilin-color production, the demand causing an excessive production has weakened, so that this branch of industry at the present moment suffers severely. This is shown especially in the case of acetic acid by its unprecedented fall in price.

We may calculate the production of 100 per cent. methyl-alcohol in the years 1872 and 1873 as at least 1,320,000 to 1,540,000 lbs. per year corresponding to about 5,280,000 lbs. of 100 per cent. pyroligneous acid; certainly a large quantity, and which, in conjunction with the acetic acid produced from alcohol, far exceeds the demands of Germany.

Apart from the productions of the proper chemical major-industry, lies the manufacture of a great number of *pharmaceutical-technological* and *scientific chemical substances*, which we cannot properly pass by in silence, since it is especially this manufacture which has been brought to a high degree of perfection in Germany. This agrees particularly with the considerations already introduced at the beginning, that the high perfection which the study of chemistry in general has attained in Germany has made this branch of industry, demanding relatively the largest amount of chemical knowledge, capable of competing with any of the foreign manufactures.

Concerning the extent of their production, the amount is far outweighed by the value of the products, so that a not inconsiderable number of them, as respects their sale, may be classed among the products of the chemical major-industry. From the field of inorganic chemistry, we shall only refer to those of the great number of acids and salts which are used in pharmacy.

The dyeing, printing, galvano-plastic, and pyrotechnical establishments, in short a large number of technological industries, make the discoveries of science useful to their purposes, and even of the rare metals but few can be named which as such, or as some of their compounds, find no application in technology. To see their way in this enormous labyrinth, to have a knowledge of the wants of the day, to keep an open eye and ear for every novelty, is the task of these establishments. Owing to the daily increasing material, divisions have taken place within the chemical minor-industry. The organic has not only separated itself from the inorganic, but is itself split asunder in all directions.

In regard to the field of organic chemistry, the front place is held by manufactories producing *alkaloids*. The difficulty of overlooking the drug-market, combined with the extraordinary variations in price, according to the results of the harvest of many drugs, as opium, cinchona, etc., make a careful observance of the market a necessary condition, and hence it was in this department that a division of labor was first perfected.

We find in Germany a whole series of manufactories occupied exclusively with the production of alkaloids. Unfortunately the statistical material at our disposal

is unserviceable in judging of the value and extent of the total production, so that we must confine ourselves to referring to this deficiency.

The manufacture of *alcohol preparations*, more particularly of ether, acetic ether and absolute alcohol, is confined to a few of the larger manufactories, since the difficulties of transportation of these liquids, and furthermore the burdens of duty, render an extended export impossible. From its great production of alcohol, hardly any other country can compare with Germany in the production of these articles.

Indirectly connected with these preparations are fruit-ethers, chloroform, chloralhydrate, tannin, pyrogallic acid, iodoform, etc., with which products Germany supplies Russia, France, England and the United States.

The consumption of *chloral-hydrate*, which promised to become an article produced on a large scale, does not appear to increase. The export of the substance is, however, considerable.

Potassium iodide and bromide, although their manufacture in foreign countries is not inconsiderable, may be mentioned as export articles.

A specifically German industry is the production for science of important and interesting *chemical preparations*, particularly in the domain of *organic chemistry*. The Exhibition gives an agreeable picture of the progress in this field. Even although the pecuniary results, owing to the small demand, can be but small, yet they are well calculated to obtain in foreign lands a good name for German knowledge and wealth. The bond of sympathy which unites these establishments with science and its followers bears the latest chemical acquisitions to the remotest regions, and gives the proper guidance to their technical utilization.

Salicylic acid and its derivatives, and *vanillin* are striking examples of the above. The first, an ordinary organic acid extracted from the gaultheria oil (winter green), attracted no attention so long as its price corresponded to the expensiveness of the raw material. Since a convenient method of preparation from Phenol has been invented, however, it has become the object of a lively manufacture, and its applications increase with the ease of its production.

Artificial *vanillin* which hardly a year ago first became known in chemical circles, is now in great demand as a substitute for the natural vanilla. While until then, we obtained the vanilla aroma from tropical countries, we are now able to produce it in any quantity from the pine forests.

In the manufacture of essential oils, also, the endeavor is made to emancipate ourselves more and more from the silent operations of the plant, and to utilize materials more conveniently to be obtained. As examples, may be mentioned the gaultheria-oil, the bitter-almond-oil, the mustard-oil and the latest of all, the oil of the *Spiræa Ulmaria*, the Salicylic Aldehyd. Owing to the cost of the materials for research, it is but natural that advance in this path is somewhat restrained, but it is not to be doubted that eventually a large part of the essential oils will be produced by Synthesis.

ALIZARIN.

BY CARL RUMPF.

After all the lighter oils used for manufacturing anilin colors are separated from coal-tar by distillation, by successive heating up to about 170°C., the temperature of

the still is raised to 210°C ., and thereby the important *anthracen* is obtained, a body which, in a state of purity, is a hydrocarbon, has the chemical formula $\text{C}_{14}\text{H}_{10}$, and furnishes the raw material for the preparation of alizarin. According to the quality of the coal used for the manufacture of illuminating gas, the tar contains from 1 to 2 per cent. of pure anthracene.

The important invention of making it serviceable for the production of alizarin, resulted by accidental circumstances.

In 1868, Messrs. Graebe & Liebermann, of Germany, experimented with alizarin ($\text{C}_{14}\text{H}_8\text{O}_4$), contained in, and centuries since extracted from madder, with the view of finding improvements for its use in printing on cotton, when they obtained a compound having the chemical composition represented by $\text{C}_{14}\text{H}_{10}$. Finding this to be also the corrected formula of anthracene from coal-tar, they promptly went farther on with the right inspiration—that if alizarin from madder could be traced back to anthracene, it wanted only a practical way for introducing four atoms of oxygen into, and withdrawing two atoms of hydrogen from, the coal-tar anthracene, to make it alizarin.

This correct idea was their invention. But as is often the case with such important revolutions, brought about by chemical genius, they had only broken the ice without opening the river for navigation. The processes they had adopted turned out to be impractical for cheap production in larger quantities, and only after experimenting for several years more practical processes have been found by us and others, which opened the way for the immense production it has reached already, and affect very materially the cultivation of madder.

The crude distillate is brought into the market in a concentration of generally 25 to 30 per cent. of pure anthracene. It is a doughy, pasty mass, which, besides anthracene, contains also lubricating oils of high boiling points. In order to prepare this crude anthracene for use at the factory, or, to make it more plain, to free it from a part of the homologous admixtures which hinder the subsequent process of oxidation, it is, after previous heating, freed first from part of its oils by hydraulic pressure, and then shows 40 to 50 per cent. of pure anthracene.

Through further treatment, either by means of solvents—for instance, naphtha, petroleum ether, etc.—or by sublimation, it is more purified, so as to contain from 68 to 90 per cent. $\text{C}_{14}\text{H}_{10}$. For special purposes it is prepared in a more perfect state by crystallization with 95 per cent. $\text{C}_{14}\text{H}_{10}$, or even chemically pure, which, by sublimation, gives beautiful crystals.

In order to produce alizarin as the ultimate product from anthracene, different methods may be adopted, either by forming *bichlor-anthracene* $\text{C}_{14}\text{H}_8\text{Cl}_2$, or, *bibrom-anthracene* $\text{C}_{14}\text{H}_8\text{Br}_2$, or by oxidizing anthracene with the assistance of bichromate of potassa and sulphuric acid into *anthraquinone*, which, when chemically pure, has the formula $\text{C}_{14}\text{H}_8\text{O}_2$, and crystallizes in beautiful needles.

It is, of course, impossible for us to specify the many different methods by which the point aimed at, viz., alizarin, can be, and is, reached; but we give the following way, tested in practice, which renders it possible to obtain a clear insight into the successive development of the end product.

Both bichloranthracene and bibromanthracene, as well as anthracene chlorinated by special processes, and also the anthraquinone form when heated with anhydrous

oil of vitriol a sulpho-acid (a crude anthraquinone product practically workable), which, according to its subsequent purification or treatment, furnishes a material—*sulphanthraquinonic acid*—for the production of alizarin, dyeing with scarlet or blueish tints.

If the sodium salt of sulphanthraquinonic acid, together with caustic soda, is heated up to a high temperature, the *alixarate of sodium*, $C_{14}H_8Na_2O_4$, is formed as a crude fused mass, fit for farther factory purposes. On decomposing this salt by an acid, the *alixarin* $C_{14}H_8O_4$ is obtained, which, carefully purified, comes into the trade as a paste of 10, 11, 15 or 20 per cent. concentration.

The preparation and use in this watery state has hitherto proved to be the most advantageous and practical form of alizarin, as, if it is furnished in a dry state, a perfectly equal solution and distribution afterwards in the dyeing bath or in the thickening for printing, would be found very difficult.

In this respect, also, is shown the essential difference of character between the alizarin colors and the anilin colors, which latter in dyeing form only a precipitate on the fibre, and are therefore not fast, especially when exposed to the influence of the light, whereas alizarin is a fast color, because it is an acid which, in combination with other mordants, by a process of oxidation similar as is the case with indigo, develops the red, violet, orange, black or brown tints in the fibre, thereby producing it fast against light and even the strongest fulling.

Alizarin crystallizes and sublimes in red needles. By a double decomposition of a solution of alixarate of potassium, or alixarate of sodium and soluble metallic salts, the corresponding difficulty, soluble alizarates, are obtained.

The most interesting, wonderful fact which will strike our minds with surprise while investigating the above processes, is that in coal all that remains from the trees and vegetation of gigantic antediluvian forests should have been discovered a raw material, and from it a color of exactly the same chemical identity and composition as that which so far was extracted only from the root of the insignificant plant *Rubia tinctorum*, generally known as madder. After such success, it is quite natural that efforts have been made to go still a step farther in this direction, and that we, as well as many others, hammer already for a considerable time at the solution of another immense problem, viz, the artificial production of real indigo.

VARIETIES.

THE ANTISEPTIC ACTIONS OF SALICYLIC AND BENZOIC ACIDS ON BEER-WORTS AND URINE. By E. von Meyer and H. Kolbe.—A reply to certain statements of Fleck in opposition to the views enumerated by the authors of this paper. They find that salicylic acid acts differently upon yeast when added to worts when the yeast and acid are added to glucose solutions. Whilst .5 gram salicylic acid in 1,000 cc. sugar-solution checks the action of 15 grams of beer-yeast, the same quantity of the acid when added to 1,000 cc. of wort has no apparent influence upon 10 grams of yeast; but .5 gram benzoic acid stops the action of 1 gram of preserved yeast, whilst the action of this is not checked by .5 gram salicylic acid.

The key to the explanation of this was found in the fact that salicylic acid dis-

solves more readily in worts than in a simple solution of glucose; and it was found that ether does not extract the whole of the acid when shaken with the former solution until after acidification with hydrochloric acid. Further experiments showed that a molecule of disodio-hydric phosphate fixes two thirds of a molecule of salicylic acid, whilst one molecule of the same salt is capable of fixing only half a molecule of benzoic acid. Since it is only the free acid which exercises an antiseptic or anti-fermentative influence, and beer worts contain phosphates, the differences in the behavior of salicylic and benzoic acids respectively to worts receives a ready explanation.

As might be expected from the richness of urine in phosphates, a larger quantity of both acids is required to check putrefactive changes in urine than to prevent the fermentation of saccharine solutions and worts. In both cases .5 per 1,000 of free acid was about the quantity necessary to effect the object in view.

It is obvious that when antiseptic uses are in view, salicylic acid should not be employed dissolved in solutions of sodium phosphate, borax, or other alkaline medium.—*Jour. Chem. Soc.* [Lond.], June, 1876, from *J. Prakt. Chem.* [2], xii, 178—203.

AN ALKALOID OCCURRING IN THE BRAIN AND THE LIVER, AND IN THE WILD POPPY. By F. Selmi.—In examining the brain or liver for poisonous alkaloids, if after treatment with ether, it is extricated with amylic alcohol to ascertain if morphia is present, and the solution is evaporated, a yellowish residue is obtained partially soluble in dilute acetic acid. On adding a drop of iodized hydriodic acid to this solution after it has been concentrated at a gentle heat, and immediately examining it under the microscope (650 diameters), brown crystalline plates will be observed, sometimes solitary, sometimes united to form a cross, and rapidly disappearing, being transformed into brown oily drops. The same phenomena are observed even when the acetic solution has been evaporated to dryness and heated for some time to 120°, if the residue is again dissolved in water and tested with the iodized hydriodic acid. As these crystals closely resemble those produced with morphia by the action of the same reagent, it is always necessary in toxicological researches to apply the iodic acid test. On agitating the amylic extract with water several times, the alkaloid is dissolved out, yielding an alkaline solution, which after being acidulated with acetic acid, gives the above-mentioned reaction even more definitely. The quantity contained in the brain and liver is, however, very small.

When examining the green heads of the wild poppy for morphia, by exhausting them with alcohol, mixing the extract with baryta, and finally treating it first with ether and then with amylic alcohol, the author observed that the amylic solution behaved in a manner precisely similar to that obtained from the brain and liver; the acidified aqueous extract giving fugitive crystals identical in form and color with those previously mentioned: no morphia, however, could be detected, neither did the dried capsules contain any alkaloid giving these reactions. On keeping the alkaline solution obtained by agitating the amylic extract with water, it lost its alkaline reaction after a week and no longer gave the same kind of crystals with the iodized hydriodic acid. The solution, saturated with acetic acid, may, on the contrary, be preserved unaltered if mixed with an equal volume of alcohol. The author gives a list of the reactions of this alkaloid with 13 different reagents, which reactions are identical, whether it has been prepared from green poppy heads or from the alcoholic extract of the brain. This should be made with absolute alcohol, then precipitated by basic acetate of lead, filtered, and mixed with ether; this produces a second precipitate which is to be removed, and the clear solution evaporated after the lead has been separated by means of ammonium sulphide. The second lead precipitate produced by the ether, when decomposed in a similar manner, yields a substance differing from the new alkaloid, in that it does not give any precipitate either with the iodide of potassium and cadmium, or with Mayer's reagent.—*Ibid.*, from *Gazzetta Chimica Italiana*, v, 398—402.

SELF-PRESERVATION OF GRAPES IN SPIRIT. THE CONSEQUENCE OF THE MANNER OF EXISTENCE OF CELLS OUT OF CONTACT WITH THE AIR. By G. Missaghi.—The author found that some grapes which had been left for a considerable time (eight months) in an atmosphere of carbonic anhydrid confined over mercury did not decompose, but that acetic acid, formic acid, and alcohol were produced, a small cavity which was formed where the stalk is inserted into the fruit being filled with the liquid. The rest of the grapes remained in the normal condition, but their flavor was similar to that of fruit which had been kept for a long time in strong alcohol.—*Ibid.*, from *ibid.*, v, 421—422.

DETERMINATION OF SULPHURIC ACID AND SOLUBLE SULPHATES BY MEANS OF STANDARD SOLUTIONS. By M. H. Pellet.—The author first precipitates the sulphuric acid by chloride of barium in excess, precipitates the excess of chloride of barium with yellow chromate of potash, and finally determines the chromate with standard solutions of protochloride of iron and permanganate of potash.—*Chem. News*, July 7th.

NEW PROCESS FOR THE MANUFACTURE OF DEXTRIN. By M. Anthon (*Dingl. Pol. Journ.*).—At present fecula in the separate state is exclusively employed in the preparation of dextrin, all that portion being wasted which is retained by the fibrous part of the potato or of the bran. To prevent this loss the author recommends the use of the entire potato dried and ground after being freed from its soluble principles by washing in acidulated or alkaline water. The fecula thus obtained is sprinkled with hydrofluosilicic acid (0.5 to 1 per cent. of the weight of the fecula); it is then placed in a drying-room at 38° to 44°C. till there is no further loss of weight; the temperature is then raised to 70° to 75° till no loss occurs, and finally to 90°. The desiccation being thus complete the fecula, whilst still hot, is placed in large flat sheet-iron troughs which are introduced into large stoves heated to 100° to 125°. The transformation into dextrin is known to be complete when a sample taken out, on being cooled and moistened with cold water, adheres together in little glassy globules.—*Chem. News*, June 23, 1876.

MINUTES OF THE PHARMACEUTICAL MEETING.

A pharmaceutical meeting was held August 15th, 1876, Edward Gaillard in the chair. The minutes of the previous meeting were read and corrected so as to read, "a stone jar in which balsam of *Peru* was imported, was presented by Cramer & Small."

Prof. Maisch presented, from J. W. Lloyd, a specimen of willow—*Salix Muhlenbergiana*, a large amount of which was attempted recently to be thrown upon the market as *epilobium augustifolium*; the fraud was happily discovered before it reached the hands of persons unacquainted with the herb. A herbarium specimen of *epilobium* was exhibited for comparison, and attention called to Gray's description of this species of willow as *S. humilis*.

Prof. Maisch read a paper entitled Notes on the Genus *Teucrium*; also one on *Fucus Vesiculosus* and other allied species (see pages 392 and 395) and dried specimens and colored illustrations of the plants described in the two papers were shown to the members.

Prof. Remington exhibited Hill's Consecutive Numbering Machine, and illustrated its method of working. He had examined several appliances of this kind with the view of numbering prescriptions so as to avoid duplications, and believed this one to possess some advantages over others. It can be started at any

number, and if desired, will make duplicates; the one exhibited will number from 1 to 99,999, and its price is \$25.

Dr. Pile said that recently, while preparing diluted phosphoric acid by Markoe's modified process, during the evaporation the attendant allowed the temperature to rise to 600°F. After making it of the proper strength, it was tested with ferric chloride, which produced a gelatinous precipitate, from which he inferred it had turned to the variety which produced this precipitate. After a few days it was again tested, but no precipitate was formed. Thinking that if the diluted acid was prepared from the glacial acid, that by waiting some time the same facts might be observed, made the experiment and found the precipitate formed would re-dissolve upon standing, but would always be produced.

The meeting adjourned to meet October 17th, 1876.

WILLIAM MCINTYRE, *Registrar.*

EDITORIAL DEPARTMENT.

THE next meeting of the American Pharmaceutical Association promises to be the largest one ever held. From information received from various parts of the country, it seems that many of the members have postponed their visit to the Centennial Exposition to the beginning of September, when the temperature may be expected to be more agreeable than during the unusually hot summer which is now near its close, and when the prospect of meeting so many friends from all parts of this continent will hold out additional inducements to pay a visit to the city where the International Exposition is being held this year. It is to be hoped that the members, who have accepted queries for investigation, will have prepared their reports in due time, and that those who may know of new or interesting subjects will bring them forward, either in the shape of a report or as a matter for discussion. Members attending the meeting may know beforehand many of the subjects which are likely to elicit discussion before the association, by consulting the list of queries which have been accepted for research, and each one may in this way contribute towards increasing the interest of the meeting.

While under such conditions a few days will undoubtedly be profitably spent, the many useful and interesting articles which have been sent to Fairmount Park, from all parts of the globe, will claim the attention of all to a greater or less extent, and it is these varying interests which require to be harmonized, so that the visitors may be enabled to derive the greatest possible benefit from their attendance. This subject in particular has claimed the serious attention of the joint committees engaged in making preparations for their visiting brethren, and it is believed that the plan which they will submit to the association will meet the approval of the members, as it will most likely harmonize the various interests and enable all to derive the greatest possible benefit from their visit.

The necessary accommodations have been another subject of concern for the committee, since in September various national conventions and meetings of societies will doubtless bring a large number of strangers to this city. This matter has also been satisfactorily arranged, and if members will notify the permanent secretary in due time, there will be no difficulty to provide suitable accommodations for all within a convenient distance of the place of meeting.

And the visiting ladies? We are sure that during their stay here they will not lack any attention; and that the twenty-fourth meeting of the association will form another link in those pleasant recollections which bridge over the time from one meeting to another, and make all participants look forward with unalloyed pleasure towards the next one.

THE AMERICAN JOURNAL OF PHARMACY.

OCTOBER, 1876.

THE TWENTY-FOURTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The Committee of Arrangements appointed by the Association in 1875, and the Local Committee of Pharmacists and Druggists had accepted the offer of the Philadelphia College of Pharmacy, the Trustees of which institution had placed the College building at the service of the Association. It having been found impossible to secure good accommodations for all the expected members at any one or two contiguous hotels, owing to the throng of visitors to the International Exposition, the College building was selected as the general headquarters and place for holding the meeting. The main hall was tastefully decorated with exotic plants, most of them yielding medicinal products, loaned for the occasion from the conservatory of Prof. G. W. Wood, and served as a general reception and reading-room; the adjoining library was arranged as the office of the Actuary and of the Local Reception Committee, and provided with facilities for writing letters. The sessions were held in the lower lecture-room, which was decorated with the coats-of-arms of the United States, the State of Pennsylvania and city of Philadelphia, and portraits of some of the deceased members of the Association adorned the walls. The upper lecture-room and the laboratory were thrown open to afford the visitors ample opportunity to inspect at their leisure the entire building of the College.

First Session—Tuesday afternoon, September 12.

President Markoe called the meeting to order at 3½ o'clock P. M., about 300 members being present at the time. J. M. Maisch acted as Secretary. The chair appointed a Committee on Credentials, consisting of Messrs. Wm. Neergaard, New York; W. J. M. Gordon, Cincinnati, and Joseph P. Remington, Philadelphia. While the com-

mittee was engaged in examining the credentials of delegates, the President read his annual address, in which he reviewed the labors of the Association accomplished since the time of its organization in 1852; the present meeting is the twenty-fourth since the organization of the Association, but the twenty-fifth since the initiatory meeting of the Colleges of Pharmacy of Massachusetts, New York and Philadelphia took place in the city of New York, October 15th and 16th 1851.

The following invitations were laid before the Association: From the Academy of Natural Sciences to visit their extensive museum; from the Union League to visit their hall on Broad street, the badge of the Association being in both cases sufficient in lieu of regular admission tickets; also, from Mr. James W. Tufts, inviting the members to make use, at their pleasure and convenience, of his pavilion erected near the Globe Hotel, and in the vicinity of one of the principal entrances to the Exposition; also, through Mr. Delacour, an invitation to visit the Masonic Temple on Friday forenoon at 10 o'clock. The invitations were accepted with the thanks of the Association.

Mr. Bullock moved that a committee be appointed, to report at the next meeting, on the articles of pharmaceutical interest contained in the International Exposition. Mr. Menninger amended that the committee report to the Executive Committee, and that the report be published in the next volume of Proceedings, but that the publication of the latter should not be delayed in case the committee should be unable to complete their labors in time. The motion as amended was carried, and the number of members to serve on this committee fixed at nine. The following were appointed at a subsequent session: Prof. Joseph P. Remington, James T. Shinn and A. W. Miller, of Philadelphia; Prof. J. F. Judge, Cincinnati; Wm. Saunders, London, Ont.; Prof. S. P. Sharples, Boston; A. P. Sharp and John F. Hancock, Baltimore, and Prof. Emlen Painter, San Francisco.

The Committee on Arrangements being called upon, Dr. A. W. Miller read the report, containing, among others, the suggestion that the Association meet on alternate days, and devote the intervening days to visiting the International Exposition under the guidance of some of the local members. This proposition created some discussion, but was finally adopted with the understanding that the Association could finish its labors during the same week, and with this object in

view, a motion by Prof. Judge, that evening sessions be held on the days when the Association met for business, was carried by 89 affirmative against 57 negative votes. The suggestion of the Committee on Arrangements to invite to seats on the platform the two surviving original members of the Philadelphia College of Pharmacy was unanimously carried; the gentlemen are Daniel B. Smith, the first President of the American Pharmaceutical Association, in 1852, and Peter Williamson, the Acting Secretary at the organization of the College named, in 1821.

The report of the Committee on Credentials was now read. Delegates were accredited from twelve colleges of pharmacy (Philadelphia, New York, Cincinnati, Massachusetts, Maryland, Chicago, Louisville, St. Louis, National, Tennessee, California and Ontario), nine State pharmaceutical associations (New Jersey, Rhode Island, Maine, South Carolina, Georgia, Connecticut, Vermont, Michigan and New Hampshire), six local associations (Newark, Camden, Washington, Richmond, Chicago Drug Clerks', and German Apothecaries', of New York) and nine alumni associations (Philadelphia, New York, New York Alumni Association of Philadelphia College, Maryland, Massachusetts, Chicago, Louisville, St. Louis and Cincinnati).

Seventy-six candidates for membership were reported by the Executive Committee, and unanimously elected; Messrs. E. T. Dobbins and Wm. Saunders acting as tellers.

The reports of the standing and special committees were called in and laid upon the table for future consideration. The report of the Executive Committee being called up, was read by the chairman, Geo. W. Kennedy. Amongst the work performed by this committee during the year was the carrying out of the instruction received at the previous meeting—to design and get up a badge for the members of the association; it consists of a trilobed leaf, upon which is impressed a mortar and a Liebig's condenser, the latter bearing upon the cooler the inscription, "Am. Phar. Ass'n;" finished in nickel-plated metal it may be obtained from the Secretary, at 50 cents each. The officers and the committees actively at work during the meeting were likewise provided with badges.

The Permanent Secretary gave an account of the work connected with his office, and suggested that several special committees be made standing committees.

The two last mentioned reports were accepted, and on motion, referred to a special committee to consider the suggestions contained therein, and report at a future meeting. The chair appointed, at a subsequent session, Messrs. Paul Balluff, New York; Jno. C. Wharton, Nashville, and E. H. Sargent, Chicago, on this committee.

After the appointment of the Nominating Committee, the association adjourned until Thursday morning, at 9 o'clock.

Second Session.—Thursday morning, September 14th.

In the absence of the President, Vice President Fred. Hoffmann, called the meeting to order. After the approval of the minutes of the first session, letters were read from "Danmarks Apotheker Forening," "Schweizerische Apotheker Verein" and "Deutsche Apotheker Verein," acknowledging the receipt of invitations to be present at this meeting. The letters were ordered to be filed and spread on the minutes.

Prof. Remington introduced the following gentlemen from Japan: Messrs. S. Nagayo, Chief of the Imperial Board of Health and Director of the Medical College at Tokio; H. Miyaka, Professor at the Medical College of Tokio, and Commissioner of the Imperial Board of Health, and S. Iwanaga, of the Imperial Commission of the Board of Health. Prof. Th. G. Wormley, of Columbus, Ohio, and Wm. H. T. Kiersted, President of the Association in 1860-62, were introduced by Dr. Squibb. All these gentlemen were warmly welcomed, and conducted to seats upon the platform.

The Nominating Committee recommended the election of the following officers and standing committees: Charles Bullock, Philadelphia, President; Samuel A. D. Sheppard, Boston; Gust. J. Luhn, Charleston, and Jac. D. Wells, Cincinnati, Vice Presidents; Chas. A. Tufts, Dover, N. H., Treasurer; John M. Maisch, Permanent Secretary; C. L. Diehl, Reporter on the Progress of Pharmacy.

Executive Committee—George W. Kennedy, Pottsville, Pa.; Chas. H. Dalrymple, Morristown, N. J.; Wm. H. Crawford, St. Louis; John Ingalls, Macon, Ga., and the Permanent Secretary *ex-officio*.

Committee on the Drug Market—Wm. Saunders, London, Ont.; Wm. H. Wickham, N. Y.; John F. Judge, Cincinnati; N. Gray Bartlett, Chicago, and C. F. G. Meyer, St. Louis.

Committee on Papers and Queries—Wm. McIntyre, Philadelphia; Louis Dohme, Baltimore, and Jos. L. Lemberger, Lebanon, Pa.

Business Committee—Joseph Roberts, Baltimore ; Henry S. Wellcome and Chas. Rice, New York.

The nominees were severally elected, and Messrs. E. R. Squibb and Fr. Hoffmann appointed a committee to conduct the President elect to the chair. Mr. Chas. Bullock assumed the presidency with a few remarks suitable to the occasion.

The Treasurer read his annual report of receipts and disbursements during the past year. It was suggested that the balance on hand be deposited, and an Auditing Committee was directed to be appointed, for which duty the chair selected Messrs. Shinn, of Pennsylvania ; Leis, of Kansas, and Ingalls, of Georgia. It was likewise ordered that members dropped for being in arrears, be requested to return their certificates of membership.

The Committee on the Revision of the By-laws, in compliance with the direction of the meeting of 1875, presented a printed report, which was distributed among the members, the consideration being deferred to a subsequent session.

The Committee on the Ebert Prize read their report (see "*Amer. Jour. Phar.*," 1876, p. 227), which was accepted and adopted.

The Committee on Maximum Doses made a report, showing that they had conferred with the American Medical Association, by which body a committee had been appointed to act in conjunction with the committee appointed by this Association. The report was, on motion, accepted, and the committee continued.

The report of the Committee on Legislation was read by J. M. Maisch. It was, on motion, accepted and the Secretary instructed to incorporate all other modifications of pharmacy laws, passed during the past year, which may come to his notice.

A report was read by the Committee on the Liebig Memorial and, since the object has already been accomplished, it was, on motion of Dr. Menninger, resolved that the funds collected by the committee be returned to the donors, and that the committee be discharged.

Dr. Hoffmann read the report of the Committee on Metrical Weights and Measures, advocating the adoption of this system. Mr. Wiegand presented a memorial arguing against the immediate introduction of the metric system. The two papers were accepted and referred to a committee of three, to report at a future meeting. Messrs. E. S. Wayne

of Cincinnati, J. F. Moore of Baltimore and Israel J. Grahame, of Philadelphia, were subsequently appointed to this duty.

The Committee on the Photographic Album presented a report, which was accepted and referred. On motion of Dr. Menninger, the committee was discharged and the albums placed in charge of the Permanent Secretary.

Mr. A. L. Calder, Chairman, read the report of the committee to whom had been referred the letter of Mr. B. Lillard, then Treasurer and acting Secretary of the Tennessee College of Pharmacy. The report was accompanied by two letters from the Registrar of that College, and concluded by stating that the "committee, accepting the written statements of the Tennessee College of Pharmacy as facts, are of opinion that that College has not departed from an honorable course in tendering or conferring its degrees." After some personal explanations by Mr. Lillard, the report was adopted.

Mr. Eberle read the report of the Committee on Julius Fehr's Complaints, finding "that neither of the Committees (on Specimens and on Papers and Queries) are in fault, and that the omission from the printed minutes, of the remarks which Mr. Fehr did make are no fault either of the Secretary nor of the stenographer"; and offering the following resolutions:

1. That the complaints of Julius Fehr against the Association be dismissed.
2. That no patented or proprietary article, or one the composition of which is held in the least degree in reserve, shall receive official notice at the hands of the various committees of this Association, without further action on its part.

The report was accepted and adopted, after which, on motion of Prof. Babcock, Mr. Fehr was allowed five minutes to make some explanation. These remarks were of such a nature that Dr. E. R. Squibb moved that Mr. Fehr be expelled from the Association for using indecorous language to its members, committees and officers. Amendments to this motion, to indefinitely postpone, to permit Mr. Fehr to apologize, and to lay upon the table, were voted down, and the original motion was then carried by a vote of 106 in the affirmative against 19 in the negative.

Invitations were received from Messrs. H. C. Fox Sons & Co., to visit their glass works, and from the Zoological Society, of Philadelphia, to visit the Zoological Garden, located in Fairmount Park, the

badge of the Association admitting to the grounds free of charge. The invitations were accepted, with thanks.

Dr. Squibb read a paper "On the administration of phosphorus," recommending a solution in cod-liver oil, containing one per cent. of phosphorus; the solution should be carefully made and the air entirely excluded. This may be effected by displacing the air from the bottle containing the oil, by carbonic acid gas, and then rapidly dropping into it the phosphorus, which had been previously cut into small pieces, chilled by placing it in ice water, and afterwards quickly dried and weighed. The bottle is at once corked, placed in tepid water, and agitated until the netted phosphorus is dissolved, when the solution, under a pressure of carbonic acid gas, is syphoned into one-ounce well-stoppered vials, taking care to leave the least practicable room for air. Properly prepared, the oil remains limpid and bland; exposed to the air, it becomes covered with a dark-brown pellicle, which protects the oil beneath from rapid change. It is administered by diluting the solution with more cod-liver oil, or by emulsifying the thus diluted solution with glycerin. A pill may be prepared by mixing in a mortar one part each of magnesia and powdered soap with two parts of stronger ether, and when thoroughly wetted adding one part of the phosphorus solution, the mass to be divided into the required number of pills, and these dispensed in a vial containing some magnesia and a drop of ether. The solution may also be dispensed in the form of a damp powder, by shaking together in a wide-mouth vial 140 grains each of stronger ether and calcium carbonate, then adding 50 grains of the solution, and after agitation triturating in a mortar; before the ether has completely evaporated the powder is transferred back into the vial and should now weigh 200 grains, containing half a grain of phosphorus, and may be dispensed in gelatin or wafer capsules.

The author exhibited the various preparations mentioned in the paper, and a discussion took place on the use of different oils for dissolving phosphorus, some members having attained better results with almond than with cod-liver oil.

Dr. Squibb presented the following resolution, which was laid over to be taken up for discussion at the third session:

Resolved, That the American Pharmaceutical Association devote an hour of its third session to a discussion of its interests in the United States "Pharmacopœia," with a view to the adoption or rejection of the following resolution:

"WHEREAS, By action of the American Medical Association, at its recent meeting in this city, it is proposed to discuss at its next meeting, in Detroit, in June, 1877, a proposition for that association to assume the control of the National "Pharmacopœia"; therefore

Resolved, That this Association offers to the American Medical Association its hearty co-operation in the work, in any way that the American Medical Association may find the services of this Association most useful.

Resolved, That a copy of this preamble and resolution, with the discussion had thereupon, be forwarded by the President of this Association to the President of the American Medical Association."

Third Session—Thursday afternoon, September 14th.

The Association assembled again at 3½ o'clock, Messrs. Daniel B. Smith and Peter Williamson occupying seats upon the platform. A vote of thanks was tendered to the retiring officers.

Dr. Squibb's resolution offered at the second session was now taken up, the mover presenting his arguments in favor of the resolution.

Prof. Judge, on behalf of the "Pharmacopœia" Committee of the Association, brought in a substitute for the former resolution, as follows:

WHEREAS, While at the time of the formation of the U. S. "Pharmacopœia," the method adopted for that purpose and subsequently continued for the revisions of the same, was adapted to the then existing conditions of the medical profession and apothecaries of the United States, the time has arrived for the use of better and more perfect means for accomplishing the revision of this important work, and

WHEREAS, The Pharmaceutical profession has advanced to a position, and by its great interest in the "Pharmacopœia", is entitled to take a prominent part in the revision of the same; therefore

Resolved, That this Association invite the American Medical Association to co-operate with us in said revision, and that they appoint a committee to act with our committee in conducting said revision.

Prof. Bedford moved to amend the resolution, and the amendment was accepted by Prof. Judge, as follows :

Resolved, That this Association will willingly co-operate with the American Medical Association in the work of revising the U. S. "Pharmacopœia."

A lengthy discussion ensued, during which the necessity for a change in the manner of revising the "Pharmacopœia" was generally admitted; but little unanimity seemed to prevail in regard to the plan to be adopted, some speakers favoring the creation of a council, under whose supervision the revision should be accomplished; others appeared to regard the plan followed until now as merely requiring some

modifications, while others desired the medical profession to take charge of the *materia medica* part, and to designate the pharmaceutical and chemical preparations which should be admitted, leaving to the pharmaceutical profession the entire control of devising the formulas and processes. Interesting as the discussions were, the Association was evidently not prepared for a final vote, and Mr. Sargent's motion therefore prevailed to lay the subject upon the table until the next annual meeting, so as to afford ample time for consideration.

The interesting report of the Committee on Adulterations and Sophistications was then read by the chairman, O. Eberbach, and referred for publication; and after the appointment of a committee to consider and report upon the place and time for holding the next annual meeting, the Association adjourned until 8½ o'clock the same evening. Messrs. S. M. Colcord, Boston; J. T. Shinn, Philadelphia, and J. F. Hancock, Baltimore, were appointed this committee.

Fourth Session—Thursday evening, September 14th.

After the reading and approval of the minutes, the report of the Committee on Revision of the By-laws was taken up. The committee, evidently opposed to frequent and unnecessary changes, prefer to carry out the spirit of the laws, and merely recommend to change two special committees—those on the Ebert Prize and on Legislation—to standing committees. The requisite change in Chap. VI, Art. I, of the by-laws, was approved by the Association, and the duties of the two committees defined as follows:

Article XI. The Committee on Prize Essays shall, within six months after the annual meeting at which the essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all other respects they shall be governed by the stipulations expressed by the donor. The decision of the committee, with such comments upon the successful essay only as they may deem proper, may be published in the journals of pharmacy in advance of the annual meeting of the Association.

Article XII. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report at each stated meeting of the Association what legislation has occurred during the year.

The Executive Committee presented the names of thirty candidates for membership, who were duly elected, Messrs. A. P. Brown and Wm. McIntyre acting as tellers.

The reading of essays being called for, Mr. J. D. Wells read a paper on "Senega root," in answer to query 1, giving a brief history of its introduction into medicine, and stating that it grows rather sparingly from Canada and along the Western slope of the Alleghenies through the valley of the Ohio river, being more frequent in Southern Indiana, likewise in Iowa and Minnesota, in the Virginias, North Carolina, Kentucky, Tennessee and the northern parts of Georgia, Alabama and Texas; but it is scarce in Missouri, and has not been found between 32 and 45° N. Lat. and from 97° Long. west to the Pacific coast. No accurate information can be obtained with regard to the amount of senega exported; but a leading drughouse of New York estimates the quantity at rather more than 2,000 pounds annually.

A paper by H. N. Rittenhouse, on "Ammoniacal glycyrrhizin," was read, and a handsome sample of the same, in thin, dark-colored transparent scales, exhibited. The preparation was made by the process of Z. Roussin ("*Amer. Jour. Phar.*," 1875, p. 405-410), omitting, however, the refining by resolution in alcohol, and precipitation with ether, which would add materially to the cost. It appears to be well adapted for masking the bitter taste of quinia and other compounds.

In a paper presented in answer to query 9, Mr. G. W. Kennedy proposes a fluid extract of guarana (*Paullinia sorbilis*), which is prepared by displacing the moderately-fine powder with a mixture composed of 8 fluidounces of strong alcohol and 4 each of glycerin and water, and completing the exhaustion with diluted alcohol; the first 12 fluidounces of the percolate is reserved, the remaining portion being evaporated to 4 fluidounces, and mixed with the reserved liquid.

Dr. Pile, in answer to query 8, presented a short paper, in which he stated that he had been unsuccessful in preventing the change of syrup of iodide of iron by the addition of citric acid, unless it was kept in well-filled vials and excluded from contact with the air. Several members claimed to have been quite successful in preserving the pale-green color of the preparation, even in partly-filled bottles, by adding to 20 fluidounces of the freshly-prepared syrup 5 grs. of citric acid. Other members had used it in larger proportion. In the discussion, the change of the color of the syrup from pale green to colorless, under the influence of the direct sunlight, was likewise alluded to.

The Secretary read a paper by J. U. Lloyd on "Fluid extract of

cotton-root bark," giving an account of many experiments, from which the conclusion is drawn that old cotton-root bark is without value as a medicinal agent, and that the fresh or recently dried bark alone should be used for preparing the fluid extract, which is then often of a brownish color, changing to deep red. In place of the menstruum directed by the "Pharmacopœia," a mixture of ten parts of alcohol and six of glycerin is recommended, to be followed by alcohol. Noticing the gelatinization of some fluid extracts of cotton-root bark, the author attributes this to the presence of water in the preparation, but is not prepared to offer any opinion as to the principle to which the formation of the jelly is due.

An adjournment was then had until Saturday morning at 9 o'clock.

Fifth Session—Saturday morning, September 16.

After the reading and approval of the minutes, the Business Committee offered the following :

Resolved, That the Executive Committee be instructed to carefully revise the Proceedings of this meeting prior to publication, and to expunge therefrom every irrelevant word and every word conveying any personal imputation.

Messrs. Menninger and Sheppard opposed the resolution, while Messrs. Roberts, Saunders, Judge, Colcord and Peixotto argued in favor of its passage. A motion by Mr. J. L. Schofield, to refer it to the Executive Committee without instruction, was negatived by a vote of 40 against 18. Dr. Menninger raised the point of order that the resolution was an amendment to the By-laws ; but the chair referring to the closing sentence of Art. IV, Chap. VI, ruled the point not well taken. A vote being had on the motion, 31 members were found to vote in the affirmative and the same number in the negative. A second vote was then ordered, when 51 members voted in the affirmative and 30 in the negative ; so the resolution was declared to be passed.

Mr. C. L. Eberle moved as an amendment to the By-laws to add to Chapt. VII, Art. X, the following :

A motion to expel a member of this Association shall be laid over until the session next succeeding that at which such motion is made.

Under the rules this amendment was to lie over until a subsequent session, but not having been called up, it will have to be considered at the next annual meeting.

The Committee on the place and time of the next annual meeting reported in favor of Toronto, Ont., and that the meeting be held on the first Tuesday (the fourth day) of September, 1877. The recommendations were adopted, and an invitation was then extended by the delegation from Cincinnati to meet in that city in 1878.

An invitation from the Pennsylvania Salt Manufacturing Company, to visit their works, at Greenwich Point, on Tuesday morning, at 9 o'clock, was accepted, with thanks.

Mr. Richard M. Shoemaker, Chairman of the Committee on the Drug Market, read the report of that committee, giving an account of the condition of the drug market during the past year. It was supplemented by a report from the Pacific Coast, written by Mr. Henry Steele.

Prof. Diehl read the very interesting introduction to the Report on the Progress of Pharmacy, in which a review is given of the most important observations and investigations made during the year. This portion, together with the voluminous report belonging to it, was referred for publication.

Professor E. Scheffer read an instructive paper, in answer to the query, What is lactopeptin? From his numerous experiments, the author concludes "that lactopeptin is an acidulated, saccharated pepsin, contaminated with a number of inert substances, and that in its digestive strength it is inferior to the saccharated pepsins of the market." The elimination of pancreatin and diastase from lactopeptin had been attempted by macerating the latter in water, neutralizing the solution by calcium carbonate, and precipitating by alcohol; the precipitate showed none of the properties of either pancreatin or diastase.

A paper presented by the same author and entitled "Notes on pancreatin, diastase and ptyalin," supplements the preceding; the experiments detailed therein lead to the conclusion upon which all physiological authorities agree, that pepsin acts in like manner upon all albuminoids, and converts them into pepton.

The itching principle of squill (query 18) was the subject of a paper by Mr. E. D. Chipman, who believed with Tilloy in the existence of two active principles in squill, one yellow and bitter and the other a very acrid resinoid, to the latter of which was due the itching and tingling sensation when applied to the skin. It was stated, how-

ever, that Flückiger, in his "Pharmakognosie" (1867, p. 187), and Flückiger and Hanbury, in their "Pharmacographia" (page 629), attribute the irritation produced by squill to the presence of very sharp and brittle crystals of oxalate of calcium.

The Chairman of the Committee on Papers stated that a paper "On the presence of sulphuric in commercial tartaric acid" (query 24) had been mailed but not yet received; it was referred to the Executive Committee.

Mr. Louis Dohme read a paper "On the presence of arsenic in phosphorus" (query 26). It appears that at present only two brands of phosphorus are sold in this market, one made by Gibbs & Deacon, Mount Holly, N. J., the other by Albright & Wilson, Oldbury, England. A sample of the former was found to be free from arsenic; two samples of the latter were found to contain 0.562 and 1.066 per cent. of the metal named. The arsenic was weighed as arseniate of magnesium and ammonium.

The Association adjourned until 2½ o'clock.

Sixth Session—Saturday afternoon, September 16.

The session was opened, Vice-President Sheppard occupying the chair. The appointment of a special committee of three to report on adulterations and sophistications was ordered, and Prof. E. Painter of San Francisco, E. H. Sargent of Chicago and W. H. Pile of Philadelphia appointed.

The report of the committee appointed to consider the suggestions contained in the annual report of the officers, recommended the approval of the action of the Executive Committee in providing badges for the officers and the standing committees on active duty during the meetings of the Association; the report was adopted.

Mr. Henry J. Rose, of Toronto, was nominated and duly elected Local Secretary for the ensuing year.

A paper by Mr. M. S. Bidwell, "On liquor ferri chloridi dilutus" (query 31), was read and referred; it argues in favor of reducing the alcoholic strength of the present tincture of ferric chloride to one-half.

Prof. Sharples read a paper "On the substitution in the 'Pharmacopœia' of parts by weight for absolute quantities" (query 30); the author, by his examination of the subject, had arrived at a conclusion

directly opposite to his opinion before investigating it, and argued in favor of retaining absolute quantities by weight and measure. Several members spoke in opposition to these views, and cited the practice of continental Europe, where preparations are made from formulas directing parts by weight, and where also the prescriptions are written and dispensed by weight only. It was suggested that the question be continued for another year.

The Auditing Committee reported having examined the Treasurer's books and finding them correct, there being a balance in his hands amounting to \$941.33.

Mr. Wellcome's paper "On damiana" (query 35) gave an account of the different herbs that have been used under this name ("Amer. Jour. Phar.," 1875, p. 518 ; 1876, p. 273).

Dr. Hoffmann exhibited a pharmaceutical microscope made by Edw. Messter, Berlin, Germany, and imported by him at a price of about \$15, gold. Several members discussed the advantages of the use of the microscope by the pharmaceutical student, and the Committee on Queries was requested to prepare a suitable query on this subject for investigation.

Mr. Sharples read a paper "On graduated measures," in which he condemned the conical graduate as an instrument of precision, and recommended the tumbler-shaped graduate for general use ; but for accurate work the burette, pipette or flask should be used ; also, that each person should at least make a rough test of his measures before using them, and not rely on the name of the maker alone.

Prof. Bedford read a paper by E. Gregory "On emulsions" (query 30). After describing his experiments, the author concludes that three drachms of acacia in fine powder are necessary to emulsify one ounce of any of the volatile oils, and that a little less (about two drachms) will answer for the fixed oils and balsams ; that to this quantity of gum four drachms and a half of water must be added (no more and no less), and that either the water or the oil may be added first to the gum ; but it is quickest to add the oil first, and well triturate before adding the water. Less gum can be made to yield a good result by a careful operator, but as a general practical working rule it may be said that three drachms are necessary for one ounce of oil.

A paper by Mr. G. A. Zwick, "On medicine wafers," (query 40), was

read, describing a patented process and baking-irons and moulds for producing the wafer discs.

The detection of adulterations in oleum theobromæ (query 44), formed the subject of an essay by Mr. G. Ramsperger, who experimented with cacao butter, made by himself from Caracas cacao, by expression, by ether and by bisulphide of carbon. The three samples varied in their specific gravities (0.850, 0.970 and 0.958) and in the fusing points (31 to 32°, and 33 to 34° C). Though not infallible, ether appears to be the best test to detect adulterations. Dissolved in two parts of ether (spec. grav.?) at 40° C., cacao butter yields a solution remaining clear on cooling, but becoming turbid if adulterated, either at once or after standing, or separating on spontaneous evaporation, little crystals and grains which do not dissolve again in twice their weight of ether. A similar effect upon cacao butter has anilin, and next to ether and anilin, the taste appears to be the best test.

Mr. Wm. Saunders read a paper "On American species of *Cantharis* and allied Insects" (query 47), illustrating the subject by the exhibition of specimens of the insects, and tendering the use of a lithographic plate prepared at his expense, for the forthcoming Proceedings.

Mr. O. Eberbach exhibited quite a number of samples of santonin crystallized by him from different solvents, also commercial santonin in thick prismatic and in flat crystals. The result of his inquiries into this variation is the conclusion that the form of crystals is due more to the quantities operated on, and to the conditions under which the crystallization takes place, than on the menstruum used as a solvent.

Prof. Sharples read a paper on the Adulteration of Milk, and the method of detecting it by analysis, describing the method used by him and giving the results of numerous assays of pure and adulterated milk.

An adjournment took place until 7½ o'clock.

Seventh Session—Saturday evening, September 16th.

The minutes of the previous session having been read and approved, the Nominating Committee presented the following nominations for the newly created standing committees.

For Committee on Prize Essays—Charles Rice, New York; Geo. C. Close, Brooklyn, and Edward P. Nichols, Newark, N. J.

For Committee on Legislation—John M. Maisch, Philadelphia; Sam'l M. Colcord, Boston, and Wm. H. Crawford, St. Louis.

The nominees were duly elected; also eight applicants for membership reported by the Executive Committee, Messrs. Jos. Roberts and J. F. Hancock acting as tellers.

Mr. Hancock read a paper on the arrangement of the dispensing department (query 49), expressing the views that in case of limited assistance it is very convenient to have the prescription department on the front counter; but that it is objectionable to place it in a separate room where the operator is hidden from view and cannot superintend the dispensing counter; he advocates to arrange the prescription department so that the compounder shall be in full view of the front store, and at the same time, sufficiently retired to prevent interruption; a rear counter, or even a separate room, may be arranged to serve this purpose.

A paper by Edward C. Jones, "On cinnamon water" (query 17), states that the cinnamon water of the shops is generally made from the oil of Chinese cinnamon, instead of the oil of Ceylon cinnamon, as directed by the "Pharmacopœia," and that, aside from the different taste, it was of little importance—it being used merely as a vehicle. In the discussion following, the superiority of distilled medicated waters over those made by merely dissolving the oil, was generally acknowledged.

Mr. Charles Mohr, of Mobile, presented a paper "On *Pycnanthemum linifolium*" and its chemical constituents, which he found to be volatile oil, a coutchouc-like resin, chlorophyll, a bitter resin of greenish-yellow color, soluble in 65 per cent. alcohol, and not a glucoside; a granular reddish-brown coloring matter, gum and some sugar, but no organic base. The plant has been used by the negroes in Alabama in all disorders arising from a debilitated state of the digestive organs; it was recommended in 1875 by Dr. E. M. Vasser, of Alabama, and since then has been found by other practitioners to be of value in the treatment of atonic dyspepsia.

Mr. Geo. Leis read a paper on a "Fragrant antiseptic lotion" (query 29), and exhibited several preparations. The discussion following had reference to the disinfecting action of several agents, and to the value of perfumes in the sick chamber. Madame Hutin's Cologne, which is still used in and near New York, was alluded to. Of this preparation Mr. Geo. C. Close says, in a communication to the "Pro

ceedings of the Alumni Association of the New York College of Pharmacy, 1874 :—

Used by Madame Hutin (afterwards Madame Labasse) about 1830. She was a celebrated French dancer on the stage in New York.

Oil of lavender, ʒvi ; oil of lemon, ʒvi ; oil of rosemary, ʒii ; oil of cinnamon, gtt. xx; alcohol, 6 pints.

This, although very weak, was doubtless refreshing when used, as it probably was, freely to wash with after severe exertion.

A well-informed perfumer says that it would answer the original design of cologne water, viz., as an application for the relief of headache, or for the use of the sick-room, where the ordinary sweet colognes are only deleterious. He says that oils of lavender and rosemary are always refreshing, while the sweet perfumes are often sickening to a weak person.

Mr. W. Saunders read a lengthy paper entitled, "Notes on perfumery," and exhibited a large number of the preparations for which formulas were given. Mr. Vogelbach stated that perfumes were always improved by the addition of as much water as could be taken up by the spirituous liquid without precipitating the flavoring principles.

Dr. A. W. Miller read a paper on the "Manufacture of chemicals in the United States" (query 36). The paper gives an interesting account of some chemical manufactures; but it is to be regretted that the author's efforts to obtain reliable information from all or the large majority of manufacturers, were unsuccessful.

A paper by Mr. C. A. Heinitch on "Wine of tar" (query 34) was read. A good preparation, particularly if intended to be prescribed in mixtures, can be made by triturating $1\frac{1}{2}$ ounce of tar with $\frac{1}{2}$ ounce carbonate of magnesium and 1 pint of sherry wine; but, if intended to be used as a substitute for the well-known preparation suggested by Prof. Procter, and made by the fermentation of malt, honey and yeast, and adding the tar, the author proposes to infuse 8 ounces of tar in 3 pints of beer, at a sufficiently warm temperature to keep the tar liquid, and stirring frequently during 24 hours.

The subject of "Factitious Opium" was brought forward in a paper by Prof. Remington, who had received from Kansas a sample of so-called opium, said to have been raised in Michigan. It resembled extract of lettuce, and contained no morphia.

A paper by Charles L. Mitchell, entitled "Ergotin," reviews the various attempts at isolating the active principle of ergot, and gives a formula for what the author designates as *Concentrated extract of ergot*. This is made by moistening 8 troyounces of powdered ergot with a

mixture of 8 fluidounces of water and 2 fluidrachms of acetic acid; after standing twenty-four hours, it is packed tightly in a percolator and exhausted with water; the liquid is evaporated to 4 fluidounces, mixed with the same quantity of alcohol, after several hours filtered and then evaporated to an extract. It has been tried to some extent in the hospital of the University of Pennsylvania, with gratifying success.

A paper "On the condition of pharmacy," by D. Benjamin, and a communication by Chas. Becker, were read; the latter referred to the necessity of a proper apprenticeship, and suggested the appointment of a committee with the view of securing uniformity therein and in the proper tuition and acquirements of apprentices. No action was had on the proposition.

A paper by J. D. O'Donnell, "On deodorized tincture of opium," treats of the exhaustion of the opium by percolation after mixing it with white sand, and the manipulation by which the concentrated aqueous liquid can be conveniently separated from the ether.

A communication by Messrs. J. Dunton & Co. was referred to the Executive Committee, with power to act, and a lengthy paper by Prof. C. G. Wheeler, entitled "Pharmacy in South America," was ordered to be published in the Proceedings.

The Committee on Papers and Queries presented their report, containing the queries which have been accepted for investigation during the ensuing year.

The Business Committee presented the following resolutions, which were severally adopted.

Resolved, That the thanks of the American Pharmaceutical Association are due and are hereby tendered to the papers of Philadelphia for their thorough reports of our proceedings.

Resolved, That this Association thank their presiding officers, their Secretary and their Treasurer for the very able manner in which they have discharged the duties of their several positions.

Resolved, By the visiting members, that we, in behalf of ourselves and of our ladies, do most heartily thank our Philadelphia brethren and their ladies for the very cordial reception they have extended to us, and assure them that we will carry home with us many pleasant recollections of their beautiful city and its kindly inhabitants.

On motion, the Association then adjourned, to meet again at Toronto, Ontario, on the first Tuesday (the 4th day) of September, 1877.

MEGARRHIZA CALIFORNICA—(Torrey).

NAT. ORD. CUCURBITACEÆ.

BY JOHN P. HEANEY, PH.G., SAN FRANCISCO.

(Abstract from an Inaugural Essay presented to the California College of Pharmacy.)

This plant, better known by the synonyms of the "big or giant root" and "manroot," is a herbaceous, climbing and succulent vine, growing abundantly throughout the State. It is closely allied to the echinocystis of the Eastern States, and also to a new genus called "*marah muricatus*," or California balsam apple, which has been described by Dr. Kellogg in the proceedings of the California Academy of Natural Sciences (Vol I). It is found both in dry sandy and rich soil. In the former it grows in bushy tufts about two feet high and four or more wide, being evidently somewhat stunted, but in rich soil, when well shaded, its annual stem climbs thirty to forty feet over trees and acquires its largest growth. It flowers in March and April. The remarkable feature of this plant is its gigantic root, which is perennial, tubero-fusiform, externally of a yellowish-gray color, and rugose; within white, succulent and fleshy, of a nauseous odor, which is lost in a great measure by drying, and of a bitter, acrid and disagreeable taste, which leaves a feeling of acrimony in the fauces. The Indians are said to use this root as a drastic purge in dropsy. It has also been used by domestic practitioners, in the form of decoction, both as a laxative and cathartic with good results. On drying, the root lost from 70 to 75 per cent. in weight. The dried root is externally of a yellowish-brown color and longitudinally wrinkled; internally of a white color, becoming somewhat darker by age, concentrically striated, light, brittle and readily pulverizable, yielding a whitish powder.

A preliminary examination made with the aqueous, alcoholic and etherial extracts of the fresh root led to the following conclusions, namely: That the root contained a bitter principle soluble in water and alcohol, but more readily in the latter; also a resinous, fatty matter and an organic acid, probably of a fatty nature, which was soluble in and extracted both by alcohol and ether. The probable presence of gum and pectin was likewise indicated, as well as the absence of albumen, sugar and volatile oil.

Examination of the Dried Root.—A quantity of the powdered dried root was first treated with ether until thoroughly exhausted by this menstruum, in order to remove the fatty and resinous matter. The

etherial tincture had a lemon-yellow color, and left, on evaporation, a yellowish-brown residue, which possessed the characteristic odor of the root, a slight bitter taste, was brittle and had an acid reaction.

To determine the nature of the free acid, the residue was treated with a weak solution of sodic carbonate and filtered from the insoluble portion. To the filtrate a sufficient quantity of tartaric acid was added, when whitish, oily globules were observed on the surface of the liquid. These had an acid reaction, possessed a disagreeable odor, and gave to paper a stain unaffected by heat; the author names it megarrhizic acid. The portion insoluble in sodic carbonate was treated with a solution of caustic potash in order to effect the saponification of the fatty matter, and the insoluble resinous substance was removed by a filter, washed, dried and reserved to be examined subsequently. To the solution of soap obtained was added a sufficient quantity of tartaric acid to decompose it. Ether was now added, and the mixture agitated. After a few hours the supernatant etherial liquid was removed and allowed to evaporate spontaneously, when it was found to possess properties characteristic of fatty acid bodies. The insoluble resinous substance obtained before was first boiled with water, then thrown on a filter, well washed and dried. It was afterwards dissolved in ether, and the solution decolorized by animal charcoal. The filtrate was evaporated, the residue redissolved in alcohol and then allowed to evaporate spontaneously, left a deposit, exhibiting under the microscope, a rhomboidal crystalline structure; it is evidently a resin. This *megarrhizitin* is soluble in alcohol and ether, and is unaffected by alkalies and solution of cupric sulphate.

The root previously exhausted by ether was next treated with alcohol (sp. grav. 0.835), until deprived of its bitter taste. The tincture was evaporated to a small bulk, then thrown into water to remove traces of fat or resin, and afterwards filtered. The liquid was heated to expel the spirit. To the resulting aqueous fluid was added a concentrated solution of tannic acid. A bulky gelatinous precipitate was obtained. This, being removed by a filter, was well washed and dried. It was now dissolved in alcohol (95 per cent.), the tannin thrown down by plumbic subacetate, the excess of lead removed by H_2S , and the liquid filtered and evaporated. The residue well washed with ether yielded the bitter principle pure. This process was adopted from that of Dr. Waltz, as mentioned in his analysis of colocynth.

To the principle thus obtained, the name of *megarrhizin* is given. It is of a brownish color, somewhat transparent, brittle and friable, yielding a yellowish-brown powder. It is fusible below 100° C., inflammable, more soluble in alcohol than in water, both solutions being intensely bitter. It is insoluble in ether. The following reactions, with reagents, were obtained: H_2SO_4 , dissolved it slowly with the production of first a bright red and afterwards a brown color; HCl gave a faint violet color; HNO_3 , a yellow, dull color. An aqueous solution of it produced with ferric chloride a deep color, but no precipitate; with plumbic acetate and subacetate, mercuric chloride, solution of iodine, potassa or its carbonate, or argentic nitrate, no change; with tannic acid, a bulky, gelatinous precipitate, and with bromine water, a white, insoluble precipitate. Boiled with baryta water, decomposition ensued; treated with dilute H_2SO_4 or HCl , no change was observed in the cold, but upon boiling, immediately decomposition took place, yielding glucose and an insoluble substance, which may be called *megarrhizoretin*.

This *megarrhizoretin* when washed and dried possesses a dark-brown color, a resinous appearance and is somewhat brittle. Alcohol dissolves it, but ether is only a partial solvent of it, leaving an insoluble portion behind. It is, therefore, a complex body.

The ashes showed, on analysis, the presence of magnesia, lime, iron, potassa, soda, chlorine, sulphuric and phosphoric acids, also a silicious residue.

It will be seen from the foregoing that *megarrhizin* belongs to that class of substances known as glucosides, to which belong also *colocynthin* and *bryonin*, and that it agrees with these two in many of their chemical and physical properties. But *megarrhizin* differs from *colocynthin* in the fact that *colocynthein*, the insoluble resinous substance obtained from the boiling of it with diluted acids, is soluble in ether, while *megarrhizoretin* is but partially soluble in that liquid, thereby agreeing with *bryoretin*. But it differs from *bryonin* principally in the behavior to sulphuric acid, which dissolves *megarrhizin*, yielding a brown color; while *bryonin* produces with it a blue color. Therefore, it was concluded to be a distinct principle.

Physiological Investigation.—A sample of an extract prepared from an alcoholic tincture, and also some of the bitter principle, were sent to a physician in this city to be examined physiologically, and the following note received:

"Your note with samples of the alcoholic extract and bitter principle of *Megarrhiza californica*, for the purpose of ascertaining their physiological action on the animal organism, have been received. I would state that the extract in large doses is a powerful irritant, causing gastro-enteritis and death. It produces griping pains in the stomach, nausea, vomiting and profuse diarrhœa, violent strangury, with other symptoms of renal and vesical irritation. Given in $\frac{1}{4}$ to $\frac{1}{2}$ grain doses, the extract is a drastic hydragogue cathartic, causing nausea, sometimes vomiting, griping pain and copious watery stools. In smaller doses, frequently repeated, it is a diuretic and laxative. Notwithstanding its activity, I should deem it a safe and convenient purgative, and should consider it useful in all cases where it is desirable to produce an energetic influence on the bowels. To obtain large evacuations its hydragogue properties must prove beneficial in dropsies. It also augments the urinary discharges. In intestinal inflammations it should not be used. The above is the result of a series of experiments made upon myself and others. Its toxicological action on a dog was undertaken, but proved a failure in so far as it caused emesis. Five grain doses of the bitter principle were repeated every 15 to 30 minutes, until 30 grains were administered. However, purging and frequent desire to urinate followed, but, otherwise, the animal showed no symptoms of disturbance. The following day, I again administered 5 grains of bitter principle, which was also ejected. Finding that nothing would be retained in the stomach (not even food), the animal was killed for examination, which was conducted immediately after its death. The chief morbid appearance observed was a patch of redness in the mucous membrane of the stomach near its cardiac orifice. The intestines were found to be slightly inflamed, as also the bladder, which was nearly empty. There was also a marked congestion of the kidneys."

THE QUININE-FLOWER.

BY J. DABNEY PALMER, M.D., MONTICELLO, FLA.

The Quinine-flower is an annual from twelve to eighteen inches high, has an erect green stem, linear leaves of about one-half to one inch in length, and small white flowers. The root consists of numerous slender fibres.

It is a native of Florida, and is found most abundantly in flat pine

woods, in a moderately dry soil, making its appearance in March or April, and flowering from July to September. The specimens furnished me were gathered three or four miles south of Monticello, in Jefferson county. In the lower portions of the county it is very abundant, and is successfully employed by those living in its vicinity for the cure of different types of malarious fever, the whole plant being used, either in the form of decoction or extract, and given *ad libitum*, or until the patient feels the effects of quinine in his head. It is a curious fact that persons brought under the influence of this remedy experience similar sensations—such as tension or fullness in the head, ringing in the ears or partial deafness—as when under the influence of Quinia, and hence its name. Its reputation as an anti-periodic was established during the late civil war, when, owing to the scarcity of Quinia, every opportunity was offered for testing the relative value of various substitutes.

The Quinine-flower is intensely and permanently bitter, yielding its properties to water and alcohol. A saturated tincture in doses of one teaspoonful every two hours was found sufficient to break the paroxysm of intermittent fever. Larger quantities, however, may be given in obstinate cases, or in the remittent form of the disease.

REMARKS ON THE QUININE-FLOWER.

BY THE EDITOR.

At our request Dr. Palmer has sent us some of the flowering plants referred to in the preceding paper. The plant was found to belong to the natural order of Gentianaceæ, and to the sub-order Gentianeæ, having the corolla lobes twisted (contorted) in the bud; the distinct style being deciduous, it must be placed into the section to which *Erythræa* and *Sabbatia* belong. Its botanical characters agree with those of the last-named genus, and more particularly with the group which has the white or purplish flowers scattered on alternate peduncles, and the corolla five-parted. On comparing it with the American species in the College herbarium of Dan. B. Smith, it was found to correspond with a specimen of *Sabbatia Elliottii*, Steud., which is marked *ex herbar. Chapmani*. This plant is described in "Chapman's Flora of the Southern United States" as follows:

Stem low, terete, paniculately much branched from near the base, the branches

diffuse; leaves small, sessile, the lowest obovate, the upper linear; lobes of the corolla 3 to 4 times as long as the short filiform calyx-lobes. (*S. paniculata*, Ell.) Open pine barrens, Florida to South Carolina. Aug. and Septb.—Stems $\frac{1}{2}$ to 1 $\frac{1}{2}$ feet high. Leaves 3 to 6 lines long. Corolla 8 to 10 lines wide.

In both the herbarium specimen and the plants sent by Dr. Palmer, the calyx lobes are more prominent than might be supposed from the description given, but they are evidently described as *short*, in comparison with the much longer calyx lobes of *Sabbatia stellaris*, *gracilis* and allied species, in which they are about equal in length to the corolla, while in the species under consideration they are about one-third the length. The lowest leaves are obovate, those a little higher on the stem oblanceolate, with an acute point, and become rapidly narrowed to a linear shape. The stems of the plants recently received are from 20 to 24 inches high, and consequently rather exceed the height as given by Chapman.

The herb has at first an herbaceous taste which gradually develops into a pure and persistent bitter, free from astringency.*

The popular name *quinine flower* appears to be confined to a small locality, probably to only a portion of Florida; at least, I have not been able to find it in any of the floras or popular botanical works of the United States. Porcher's "Resources of the Southern Fields and Forests," p. 556, however, mentions *Gentiana quinqueflora* under the names of *Indian quinine* and *ague weed*—and states that "this and the *G. saponaria* are esteemed fully equal to the imported gentian; in large doses they are said to be laxative; Dr. E. P. Wood, of Wisconsin, has given this plant with success in intermittent fever." He also gives a detailed account of the medicinal properties of *Sabbatia angularis*, the American centaury, and states that *Sab. stellaris* and *Sab. gracilis* possess properties similar to the former.

This genus of North American plants is closely allied to *Erythræa*, of which several species (*E. chilensis*, *centaurium*, *linarifolia*, etc.) are still employed in different countries as tonics, and sometimes as anti-periodics; but we do not remember that effects resembling quininism have been ascribed to any of those plants, such as Dr. Palmer states are experienced from the quinine flower of Florida.

THE USE OF METRICAL WEIGHTS IN PRESCRIPTIONS.

BY PROFESSOR JOHN M. MAISCH,
 Of the Philadelphia College of Pharmacy.

The desirability of uniform values of the weights and measures in use among civilized nations, and the admirable simplicity of the French or metrical system, are so apparent that this standard is now not merely legalized, but has been adopted, and is actually used, by a large majority of the nations of Continental Europe. The inconveniences attending such a change are more due to the alteration of values than to the introduction of the system with which, through the Arabic numeration, every one is familiar, and the practical application of which we have in our monetary system. The intimate acquaintance with the latter must doubtless facilitate the comparison of values, the multiples and divisions of which are based upon the same system of decimal numeration. While the general introduction of the metrical system in the United States must be regarded merely as a question of time, it cannot be denied that considerable progress toward this end would have been made, if, in accordance with a resolution passed by the National Convention of 1870, for revising the "Pharmacopœia," the Committee of Revision had "abandoned in the 'Pharmacopœia' measures of capacity, and expressed the quantities in all formulas, both in weights and in parts by weight," Coupled with the direction, "to include some part of the metrical system in the list of officinal weights and measures," the parts by weight could scarcely have been expressed otherwise than upon the basis of the metrical system.

The different value of the *grain*¹ as formerly used occasioned many difficulties in adapting formulas and doses to the weights of other countries; and for similar reasons the use of local values in measures and weights have long since been abandoned in all physical sciences, in favor of the metrical system. Medicine and pharmacy only lagged behind until a few years ago, when it was adopted also in the two branches named by nearly all civilized nations, except those speaking the English tongue, and the labor of translating the values contained in formulas and prescriptions is now almost exclusively confined to the systems of the troy weight, and the English and American apothecaries' measures, as arraigned against the metrical weight.

¹ The variation from our troy grains ranged in different countries between —11 and + 46 per cent.

It may be remarked in this place that the "Pharmacopœias" of Continental Europe and the prescriptions of physicians in those countries express all quantities by weight only, whether the material directed be solid or liquid. The greater exactness of gravimetric over volumetric measurement needs scarcely any argument, if the variation in volume under the influence of temperature is considered, and the difficulty of exact measurement in glass vessels of large diameter is taken into account. Moreover, weighing is more convenient, and those who have accustomed themselves to this method will only reluctantly change it for measuring again, if compelled to do so.

From long custom, physicians are apt to over-estimate the difficulties of writing prescriptions for liquid medicines by weights instead of measures. Medicines can be given in absolutely definite doses only, if divided by the apothecary; but their division by him is impracticable in case liquids are employed, and the familiar tea-, dessert- and table-spoons are then resorted to for dividing the medicines at the bedside. How widely these approximate measures differ from each other, and to what extent the difference is increased by the manner of measuring with them, is well known. The apportioning of doses of liquid medicine would, therefore, offer no greater difficulty as long as these convenient and handy, but variable, measures must be employed in the sick-room.

Of the officinal liquid preparations which are prescribed for internal use, the alkaline solutions (of soda, potassa and ammonia), the diluted acids, and the solutions of some salts (ammonium acetate, potassium citrate, etc.), do not differ materially in bulk from an equal weight of distilled water, this difference being less, particularly for the quantities representing their medicinal doses, than the variations of the popular approximate measures by which liquid medicines are taken. Tinctures and fluid extracts vary to a great extent in density, not only from water, but likewise among themselves. The apportioning of their doses by weight, however, would be an easy matter if the resolution of the National Convention above referred to had been carried out; for a given weight of the preparation would then represent a definite weight of the drug, and the proportion of the weight of the drug to that of the preparation would, for tinctures, most likely be 1 : 5 or 1 : 10, the standard generally adopted in Europe. Our present tinctures made with alcohol and diluted alcohol, in the proportion of two

troyounces to the pint, are very nearly of the strength $1 : 6\frac{1}{2}$ and $1 : 7$ respectively ; and those containing three troyounces to the pint, $1 : 4\frac{1}{2}$ and $1 : 5$. Tinctura opii is in the proportion of $1 : 11\frac{1}{2}$, and tinctura opii camphorata, $1 : 250$ (for opium). It will be observed that the changes necessary in the officinal formulas to bring them in harmony with the metrical system are by no means as great and revolutionary as is sometimes supposed, particularly if the necessary, or at least desirable, change in the alcoholic strength of the menstruum is taken into consideration.

A uniform standard of strength for fluid extracts would most likely be the proportion of $1 : 2$; or, to give it in the metrical system, $5 : 10$; for the proportion $1 : 1$ is unattainable in all cases where sugar or much glycerin is requisite for preservation ; and it appears to be desirable to adhere to an adopted standard, also, for those in the preparation of which alcohol or stronger alcohol is exclusively employed.

Of the remaining liquid medicines, the doses by weight can be as easily acquired as by minims or fluidrachms ; but for those who have already become conversant with the measures now in use here, the following observations will offer all requisite facilities for converting them into weights. Ether, having the specific gravity $\cdot 750$, occupies precisely the same volume as $1\frac{1}{3}$ time its weight of water, and the difference in the volume of stronger ether (specific gravity $\cdot 720$) is considerably within the limits of variation of the approximate measures ; or, in other words, three parts by weight of ether occupy the same space as four parts by weight of water. The relation of the weight of spiritus ætheris compositus (specific gravity $\cdot 815$) and spiritus ætheris nitrosi (specific gravity $\cdot 837$) to volume is very nearly as $4 : 5$, that is to say, four parts by weight of the preparations named occupy (a little less than) the same space occupied by five parts of water.

Glycerin (specific gravity $1\cdot 25$) has a proportion of weight to volume as $5 : 4$; syrups (specific gravity $1\cdot 317$) nearly as $4 : 3$; chloroform (specific gravity $1\cdot 48$) nearly as $3 : 2$, *i. e.*, $1\frac{1}{2}$ part by weight of glycerin, $1\frac{1}{3}$ part of syrup, and $1\frac{1}{2}$ part of chloroform, occupy, approximately, the same volume as 1 part of water.

If the relative density of the officinal liquids is not lost sight of, it will be seen that there is no great obstacle in the way of prescribing by metrical weights even the preparations of our present "Pharmacopœia," except in the cases of fluid extracts, which vary so consider-

ably that no reliable rule can be given for their relative proportion of weight to volume. But, with this exception, the task is comparatively easy, if it is remembered that for all practical purposes one gram equals 15 grains—that two tablespoonfuls, *i. e.*, 1 fluidounce, of water weigh 455·69 troy grains, or (within less than 8 grains) precisely the same as 30 grams (463 grains). 15 grams of water or its equivalent in bulk of other liquids is, therefore, to be taken as equal to the tablespoonful; 7·5 to 8 grams of water or its equivalent to the dessertspoonful; and 3·7 to 4 grams to the teaspoonful.

Applying these values to the heavier and lighter liquids, it will be seen that—

$$\begin{aligned} 15 \times \frac{1}{4} &= 11\cdot25 \text{ grams ether,} \\ 15 \times \frac{1}{2} &= 18\cdot75 \text{ grams glycerin,} \\ 15 \times \frac{3}{4} &= 22\cdot50 \text{ grams chloroform,} \\ 15 \times \frac{1}{3} &= 12 \text{ grams spir. æther. comp. (or nitr.),} \\ 15 \times \frac{1}{5} &= 20 \text{ grams syrup,} \end{aligned}$$

are, in measure, equal to about half a fluidounce, and that the deviation from this measure is in each case considerably less than the difference in the amounts obtained by scant and full measurement with the same tablespoon, or between different patterns of that useful domestic utensil.

The average doses of these liquids, expressed in metrical weights, are, therefore—

Ether	11·25 : 8 = 1·40 grams or $\frac{1}{2}$ teaspoonful.
Spr. æth. comp, and	
Spr. æth. nitr., 12	: 4 = 3·00 “ or 1 “
Chloroform, 22·50	: 8 = 2·80 “ or $\frac{1}{2}$ “
Glycerin, 18·75	: 4 = 4·70 “ or 1 “
Syrups (some), 20	: 4 = 5 “ or 1 “

For the conversion of grain weights of solids into grams, close approximations to the correct weight, within the fraction of $\frac{1}{34}$, are obtained by dividing the number of grains by 15. The error resulting from this rule is best appreciated by comparing the results obtained with the larger weights, thus :

	Correct weight.	Difference.	
		Grams.	Grains.
grs. lx give $\frac{60}{15} = 4\cdot00$	3·887	0·113	1·7436
$\frac{320}{15} = 32\cdot00$	31·100	0·90	13·89

The actual difference obtained by the above rule amounts, therefore,

to rather less than a plus of $1\frac{3}{4}$ grain for the drachm, and 14 grains for the troyounce.

A few examples may yet be added to show the insignificance of this difference for smaller weights; thus we obtain for—

		Actual weight.	Difference.	
			Gram.	Grain.
grs. x, $\frac{1}{8}$	= 0.66	0.648	0.012 less than	$\frac{1}{8}$
grs. viii, $\frac{1}{15}$	= 0.53	0.518	0.012	" $\frac{1}{15}$
grs. iii, $\frac{1}{15}$	= 0.20	0.194	0.006	" $\frac{1}{15}$
grs. ii, $\frac{1}{15}$	= 0.13	0.129	0.001 nearly	$\frac{1}{15}$
grs. i, $\frac{1}{15}$	= 0.066	0.065	0.001	" $\frac{1}{15}$

In prescribing by metrical weights, the amounts should in all cases be expressed in grams and decimal fractions of grams, and with Arabic numerals, in which case no signs or abbreviations are required; a few examples of prescriptions, written in the usual manner, with their (practical) equivalents in metrical weights, will readily explain this, and show the greater clearness of the latter method, and the less liability to error from indifferently made signs and Roman numerals.

R. Potassii iodidi,	.	.	.	℥ii	8.00
Iodinii,	.	.	.	gr. ii	0.13
Aquæ,	.	.	.	f℥ss	15.00
Syr. sarsap. comp,	.	.	.	f℥iiss	140.00

Dose.—One tablespoonful, containing one gram (15 grains) potassium iodide, and 0.016 ($\frac{1}{4}$ gr.) iodine.

R. Potassii nitrat.,	.	.	.	℥iiss	6.00
Vin. antim.,	.	.	.	℥xl	2.66
Tinct. digitalis,	.	.	.	f℥i ¹	3.50
Mucil. acaciæ,	.	.	.	f℥ss	20.00
Aquæ,	.	.	.	f℥iiss	90.00
Syrup. aurantii,	.	.	.	f℥i	40.00

A tablespoonful of this mixture contains 0.66 (10 grains) of potassium nitrate, 0.0012 ($\frac{1}{84}$ grain) tartar emetic, and 0.055 ($\frac{5}{8}$ grain) digitalis.

R. Morphiæ sulphat.,	.	.	.	gr. i	0.066
Pulv. digitalis,	.	.	.	gr. vi	0.40
Sacchari albi,	.	.	.	℥iiss	2.00 M.

Divide in chart. No. 12.

Each powder contains 0.0055 ($\frac{1}{12}$ grain) morphia, and 0.033 ($\frac{1}{2}$ grain) digitalis.

¹ Representing $7\frac{1}{2}$ grains of digitalis; menstruum diluted alcohol.

R. Quiniæ sulph.,	gr. xii	0·80
Pulv. opii,	gr. iii	0·20
Syrupi,	q. s.	

Fiant pil. No. xii.

Each pill contains 0·066 (1 grain) quinia, and 0·016 ($\frac{1}{4}$ grain) opium.

R. Atropiæ,	gr. ss	0·033
Alcohol,	q. s.	
Adipis,	3i	4·00 M.

Atropia ointment.

It is the writer's opinion that physicians could very materially promote the introduction of the metrical weights, since by writing their prescriptions in the manner indicated, they would at the same time compel apothecaries to procure a suitable set of weights, which would save them the trouble of calculating the grams into grains and troy-ounces; such a movement would be a great step toward carrying out the resolution of the Convention of 1870, and toward harmonizing the strength of the various pharmaceutical preparations with those of other "Pharmacopœias," or at least bringing them into a simpler relation.—*Med. and Surg. Reporter*, Sept. 9.

THE UNION OF CHLORAL HYDRATE AND CAMPHOR.

BY EARNEST C. SAUNDERS, MONTREAL.

It has long been known that a mixture of hydrate of chloral and camphor, in equal parts, formed a liquid, but it has, I believe, never been settled as to whether the result is due to chemical combination or to the solvent power of one article over the other. The following notes of an investigation into the subject may be interesting, and throw some light upon it.

Four ounces of chloral hydrate and the same weight of camphor, in lumps, were put into a bottle and allowed to stand, being occasionally shaken. In 48 hours both were completely liquefied, forming a syrupy fluid, smelling of both ingredients, and of specific gravity 1·243. Five ounces of this were placed in a flask, fitted with a wide tube leading into a receiver immersed in ice-cold water, and having a thermometer passed through the cork, the bulb reaching into the liquid. Heat being applied, the temperature rose to 224° F., at which point the liquid boiled freely. The temperature rose gradually up to 300°, from which point it rose more rapidly to 402°, when the liquid distilled unchanged.

The distillate was separated into two parts, the first being collected up to 300°, the other being that which passed over between that point and 402°. The vapor which passed over at this temperature solidified in the tube before reaching the receiver.

The first distillate was a soft greenish mass, consisting of small crystals mixed with liquid. It was found to consist of chloral hydrate, with a very small quantity of camphor, and owed the color to a minute quantity of a greenish oil, apparently the result of some chemical action having taken place between the chloral and camphor. This oil could not be obtained in sufficient quantity to be examined.

The second distillate was a thick oily liquid, having a pungent odor of chloral hydrate. It combined with a small proportion of water, but was insoluble in a larger quantity. It was miscible with alcohol, of specific gravity .937 and .838 in all proportions, and proved to be hydrate of chloral with about enough camphor to liquefy it.

The residue in the flask, which boiled at 402°, was found to solidify at 248°, and was almost insoluble in water, but freely soluble in alcohol, sp. gr. .838, was plainly camphor.

The original solution was decomposed by water, the camphor floating on the surface, while the filtered liquid gave abundant evidence of chloral hydrate on being tested.

Judging from these facts, it would seem certain that no chemical action takes place when the two articles are mixed in the cold. Both are volatile at ordinary temperatures, and the following experiment, which was performed to ascertain which was the solvent, conclusively proves that it is the vapors which act upon each other. Two lumps, one of chloral hydrate and one of camphor, were placed about an inch apart on a porcelain plate, and covered with a bell glass. In fifteen minutes the surface of the camphor was quite damp, but the chloral was quite dry. In three hours the chloral was still dry, while the camphor was quite wet and standing in the midst of liquid. In twelve hours the liquid had reached the chloral, the upper surface of which was still dry, while in twenty hours both lumps were half liquefied, and the inner surface of the bell glass was covered with moisture. This would almost seem to point out that the vapor of the chloral was the solvent, but it was found while one part of camphor would form a permanent liquid with three and a-half parts of chloral hydrate, one part of chloral, dissolved by the aid of heat, with two parts of camphor

solidified to a soft crystalline mass when cold, from the camphor crystallizing. It is most probable that the camphor is the solvent, which would also seem likely, as camphor is an essential oil, and is known to render other bodies fluid. The change of color, with the formation of an oily liquid, would seem to point to chemical action occurring when the mixture is subjected to strong heat.

The following notes of the solubility of the mixture in various articles may be serviceable to any who are called upon to dispense it, or to physicians who feel inclined to try the effects of it.

It is miscible in all proportions with alcohol, sp. gr. .838, bisulphide of carbon, ether and olive oil. It is soluble in eleven parts of alcohol, sp. gr. .937. It is insoluble in water. It forms a clear mixture with one and a-half parts of chloroform, but a further addition of three parts of chloroform renders it turbid. Camphor forms a permanent liquid with three times its weight of chloral hydrate. The experiments were conducted with the atmosphere at a temperature of about 80°; the fact is mentioned as it may have influenced the solubility slightly.—*Phar. Jour. and Trans.*, July 29, 1876.

CRYSTALLIZED HYDROBROMATE OF CONIA.¹

BY M. MOURRUT.

In a paper recently read before the Société de Thérapeutique the author described some attempts to obtain crystalline salts of conia. His first experiments were made with various acids upon the ordinary brown conia, from which crystals were obtained, but they were contaminated by a brown matter which could not be removed without great loss. The German conia, which is nearly white, was therefore substituted, and this readily gave crystals. The salt obtained most easily was the hydrobromate, by simply treating the alkaloid with the acid. When brown conia was operated on there was a rise of temperature, an evolution of white vapors, and the characteristic odor of conia became manifest; the mixture then became green, and finally black with a reddish tinge. After a short time crystals commenced to form; they were contaminated by the brown-black substances that colored the liquid, but by repeated crystallizations they were obtained colorless. There was, however, much loss with the impure alkaloid.

In operating upon the white conia the author places it in a crystalliz-

¹*Répertoire de Pharmacie*, June 25, p. 369.

ing vessel with a fragment of blue litmus paper, and dilute hydrobromic acid is added drop by drop, until the litmus paper commenced to turn red, the liquid which was at first yellow has then a rose tint. The crystallization quickly commences, and the evaporation may be expedited by a gentle heat ; there will no longer be any smell of conia.

The hydrobromate of conia crystallizes in colorless prismatic needles that are very soluble in water and alcohol, but less so in ether and chloroform. The crystals are not deliquescent ; they are odorless and have only a slight taste ; but when crushed between the fingers they give off a strong odor of conia. When exposed to the air the salt is colored red, like many other hydrobromates, but does not decompose ; in the dark it remains white. It supports a tolerably high temperature, melts at about $100^{\circ}\text{C}.$, and above that point volatilizes, giving off an odor of conia. It contains about one third its weight of bromine, but the author has not yet made an exact analysis.

The salt is reported to have been administered in hourly doses of 2 milligrams to infants one year old suffering from whooping-cough, with good results, and in 5 milligram doses to a child three years old. Dr. Regnault has also injected equal to 5 milligrams in the case of an adult suffering from sciatic pains, repeating the dose at an interval of three days, after which the pains ceased.—*Phar. Jour. and Trans.*, July 8, 1876.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Ferric Phosphate with Citrate of Sodium.—In a paper, commenting on Creuse's tasteless iron salts ("Am. Jour. Phar.," 1873, p. 214), J. Martenson recommends as especially useful the above combination, for the preparation of which he gives the following directions : 358 parts of crystallized phosphate of sodium are dissolved in 10 to 15 times the quantity of hot water, the solution is precipitated by a solution of ferric chloride, excess being avoided, and the precipitate well washed. It is transferred to a porcelain capsule, 137 parts of citric acid are added and a moderate heat applied ; the liquid is neutralized with sodium carbonate, and the heat continued until complete solution is effected, after which it is filtered, and by means of a water-bath evaporated to dryness. The anhydrous compound contains 25 per cent. of ferric oxide, but is capable to combine with more ferric phos-

phate, until it has nearly the composition represented by the formula $2(\text{Fe}_2\text{O}_3\text{PO}_5) + (3\text{NaO}, \text{C}_{12}\text{H}_5\text{O}_{11})$, which requires 28.57 per cent. of ferric oxide.

The taste of the solution is slightly saline, not in the least ferruginous; by the addition of citric acid it becomes agreeably acidulous. The aqueous solution passes completely through parchment paper and animal membrane, which is not the case with the soluble saccharated oxide of iron and the ferrum dialysatum. The two preparations named have been completely superseded in the children's hospital of St. Petersburg by the soluble phosphate mentioned.—*Phar. Zeitschr. f. Russl.*, No. 10.

Detection of Alkaloids.—A. Cazeneuve recommends to mix the powdered and moistened material with half its weight of slaked lime, and to dry one-half of the mixture in the water-bath, the other half by exposure to the air. Each portion is then separately treated with ether, and a portion of each ethereal solution evaporated spontaneously; the residues are examined by the microscope, and by dissolving in acidulated water.

Other portions of the ethereal liquids are tested with an ethereal solution of oxalic acid, whereby many alkaloids are precipitated as oxalates insoluble in ether, but dissolving again on the addition of water. If combinations of lime with fatty or resinous acids were present in the ether, the precipitate will be insoluble in water.

It must not be overlooked that other principles besides many alkaloids are soluble in ether.—*Jour. de Phar. et de Chim.*, 1876, p. 201.

Raffinose, a new saccharine substance, has been obtained by D. Loiseau in his investigations of molasses. It forms white crystals, is nearly insoluble at 20° C. in 90 per cent. alcohol, dissolves at the same temperature in 7 parts of water, but at 80° C. in all proportions. It has a greater rotating power than sugar (100 : 159), and loses at 100° C. (212° F.) 15.1 per cent. of water; its formula seems to be $\text{C}_{18}\text{H}_{32}\text{O}_{16} + 5\text{H}_2\text{O}$.—*Phar. Cent. Halle*, No. 33.

Detection of Nitrobenzol in Oil of Bitter Almonds, etc.—Jacquemin uses for this purpose a solution of stannous chloride in caustic soda. If a few drops of the suspected liquid are added to this alkaline solution, sufficient anilin is formed to produce the blue color of erythrophenylate of sodium, after the addition of one drop of phenol and a little hypochlorite of sodium.—*Chem. Centralblatt*, No. 28, from *Jour. de Phar. et de Chim.*

Piperin and Chavicin.—R. Buchheim obtained these two principles by washing the alcoholic extract of black pepper with water and treating it with ether. The residue was treated with little potassa to remove an acid resin, dissolved in alcohol, decolorized with animal charcoal and repeatedly crystallized from petroleum benzin. The piperin thus obtained was in nearly colorless quadrangular prisms, which in alcoholic solution had a peppery taste.

The ethereal solution was agitated with a little potassa solution to remove chlorophyll, fatty acids and resin, the ether distilled off, and the residue dissolved in alcohol, treated with animal charcoal, and evaporated. By repeatedly dissolving it in little ether, the piperina was nearly entirely removed, and a little petroleum benzin separated the last portions of fat. The chavicin remaining behind was a yellowish-brown mass of the consistence of turpentine and an extremely acrid pepper taste. Its alcoholic solution, boiled with potassa, yielded an alkaline distillate, which proved to be piperidina, while the residue in the retort, after dissolving in water and acidulating with hydrochloric acid, yielded *chavicic acid* as an amorphous resinous mass.

Piperina may be regarded as a piperidina, N, H, C_8H_{10} in which one H is replaced by piperic acid, thus: $N, C_{12}H_9O_3, C_8H_{10}$, and chavicin may in like manner be viewed as a piperidina in which one H is replaced by chavicic acid.

Neither chavicin nor piperin yield salts with acids.—*Phar. Cent. Halle*, No. 35, from *Buchn. N. Repert.*

Hops as a Ferment.—The fermentative principle which Sacc believes to be in hops (see “*Amer. Jour. Phar.*,” 1876, 320) does not exist, according to F. Soxhlet; a fermentable solution of sugar mixed with a decoction of hops, then boiled to destroy the organized alcohol ferments, and left in contact with filtered air only, does not undergo fermentation. The porosity of bread is produced through alcoholic fermentation; but besides this, secondary processes, and particularly lactic fermentation, are observed. Hops act as a preservative against the latter, but do not prevent the former, and are added to yeast for similar purposes as they serve in beer, namely, to prevent the secondary fermentation, for which purpose the addition to beer of a little salicylic acid has been recently recommended.—*Chem. Centralbl.*, No. 19.

The Presence in Beer of a Substance resembling Colchicia.—E. Danneberg stated recently that he had obtained from beer an alkaloid resem-

bling colchicia in its reactions ("Arch. d. Phar.," 1876, May). H. van Geldern, of Leeuwarden, Holland, has obtained the same body, in 1874, by the method of Stas and Otto, and found then that it could also be obtained from a mixture of unadulterated hops and gelatin. The latter body is always present in beer, and is possibly the cause of the precipitates formed with the general reagents for alkaloids, and which are not produced if pure hops alone be employed for the experiment.—*Archiv d. Pharm.*, July.

THE CHEMICAL INDUSTRY OF GERMANY AT THE CENTENNIAL EXHIBITION IN PHILADELPHIA.

BY THE COMMITTEE OF THE ASSOCIATED GERMAN CHEMICAL MANUFACTURERS.

II. *Painters' and other Colors, Pigments, Coloring Materials, Turpentine, Oils, Varnishes, Printers' Inks and Lithographic Inks, Writing Inks and Boot-Blackings.*

Of the mineral-colors, the ultramarine plays the most important part in the German export. Germany produces about four times as much ultramarine as all other countries, and exported in 1874, 5,060,000 lbs. Germany's production of zinc-white and lead-white may also be termed very considerable, as in 1874 it was exported 15,070,000 lbs. Concerning Germany's export of other mineral and earth-colors, Berlin-blue, Schweinfurt-, chromium- and Guignet-greens, cadmium- and zinc-yellows, cinnabar, etc., are no statistics at hand. The fact, however, that so large a number of the works producing this plenty of products, exhibit at the Centennial, is sufficient proof, that in this branch of German industry, the manufacturers lack no faith in the excellence and powers of competition of their products.

Among the products derived from coal-tar are *benzol*, *toluol*, *anthracene* and *carbolic acid* the most important as starting-points in the manufacture of colors. Unfortunately the German dying industry is as yet dependant on England, since the only partially developed tar-industry of Germany furnishes but $\frac{1}{3}$ of the amount consumed in that country.

With the progress of the anilin-color industry, greater demands were made on the manufacturers of *anilin oil*, and hence, it has become the endeavor of the German anilin oil manufacturers by a proper choice of the raw products (*benzol-toluol*) to improve the qualities of the anilin.

An important export article for Germany is the *anilin oil* for calico printing.

Preparations whose manufacture is successfully carried on by many works are *methyl-anilin* for preparation of *anilin-violet*, *diphenyl-amin*, *methyl-diphenyl-amin* for preparation of the finer *anilin-blue*, *naphthyl-amin* and *Phenylene-diamin*.

The participation of *anilin colors* and *alizarin industries* in the exhibition corresponds but little to their great importance to Germany. Hardly a quarter of the existing manufactories are represented, and yet the largest part of the coal-tar colors used in America are produced in Germany. In 1874 Germany exported 673,200 lbs. of anilin colors, and altogether furnishes about three-quarters of the total anilin and alizarin colors in the world's market.

The production of *arsenic-free fuchsin* (rubin) by the so-called nitrobenzol process may be considered as established. Aside from the undoubted results which two German manufactories have obtained by the new method, the former objection, that it could not compete with the old in cheapness, vanishes.

The manufacture of *methyl-violet* by oxidation of dimethyl-anilin, by means of copper salts, has found general introduction, and has almost entirely superseded the Hofmann-violet made with iodine, so that the iodine violet is only employed for a few special purposes. In the same manner the iodine-green has been replaced by the methyl-green produced from methyl-violet. The necessity of using large amounts of iodine, the laborious regaining and the fluctuating price of this expensive body, as well as the more beautiful shades and the cheaper prices of the violet and green colors produced without iodine, have caused the rapid abandonment of the old methods of manufacture.

The use of the various *anilin-blues* in the dying industry increases from day to day, and with it the number of sorts occurring in commerce.

The finer blues prepared from *diphenyl-amin* have as yet, it is true, only found a limited application in dyeing, but on account of their great purity will doubtless soon attain a better introduction.

In spite of its impurity, *safranin* is still used for certain purposes, especially for dyeing silk and cotton.

Corallin still finds extended application in silk-dyeing and for the preparation of paper and carpet-lacs.

Among other tar-colors manufactured in Germany, are *Martius-yellow*, *phosphin*, *picric acid*, *bismarck-brown* and *nigrosin* to be mentioned. These colors occur in commerce under the most various names.

One of the latest discoveries in the field of coal-tar colors is the *eosin*, which at present is manufactured in many German works. It promises to become a not unimportant competitor of cochineal and safflower.

Perhaps, hardly any field of chemical industry has been more severely affected from the state of the times than the production of *artificial alizarin*, whose manufacture, although so recent, yet on its first introduction in Germany increased so rapidly. In its struggle for existence against the natural color, the madder, although it has not been entirely conquered, still in the last two years has suffered severe blows. The considerably larger yield, which, of late, it has been found, may be obtained in the manufacture of alizarin, will doubtless remove these difficulties.

In the working-up of *vegetable colors* into fine color-extracts and lacs, Germany does not stand behind England and France. *Indigo*, *cochineal*, *safflower carmin*, *orseille preparations* and *color extracts, en pâte*, as well as the *colored lacs* for the colored paper and carpet industries, are produced in numerous German establishments on the largest scale, but they are very incompletely represented at the Exhibition.

III. *Extracts, Essences, Perfumes, Pomades, Medicinal Mixtures, etc.*

Essential oils are manufactured in Germany on an extended scale, Leipsic being in a certain measure the chief manufacturing city.

The wild and cultivated plants, which by proper climatic conditions are rich in powerful aromas, form the basis of this branch of industry, which is so developed through the use of perfected apparatus, that not only the domestic, but many of the foreign plants, are distilled with advantage. The extension of this business is illustrated by the fact that Leipsic alone prepares and exports 110,000 lbs. of caraway-seed-oil yearly.

The essential oils are used in pharmacy, perfumery and particularly in the manufacture of liquors.

In intimate relation with the fabrication of essential oils stands the preparation of *essences* (extracts of aromatic vegetables), which has reached a great development in Saxony.

The fruitful bottom of Middle-Germany produces a large number of *medicinal plants*, a part of which grow wild, while a part are carefully cultivated, and supplies foreign countries, particularly North America, with large amounts.

In many places *extracts* and *medicinal mixtures* are prepared. The capability and trustworthiness of the representatives of this branch of manufacture have obtained a good name for their products in foreign lands.

England and France still remain the chief furnishers of *perfumes*, *pomades* and *toilet articles*, but it is not to be denied that this branch of industry has increased in Germany since the export of these articles, among which is to be included cologne-water—maintaining its fame during two centuries—was in 1874, 1,898,000 lbs., having a value of 168,750 dollars.

MINUTES OF THE COLLEGE.

PHILADELPHIA, SEPTEMBER, 25th, 1876.

The semi-annual meeting of the Philadelphia College of Pharmacy was held this day at the College Hall.

Dillwyn Parrish, President, occupied the chair, and seventeen members were in attendance.

The minutes of the meeting in June last were read, and, on motion, approved.

The minutes of the Board of Trustees, for the last three months, were also read by the Secretary of the Board, and, on motion, adopted.

These minutes make mention of a present to the College Cabinet of a large and interesting collection of carbolic acid compounds, which are now in the Centennial Exposition, the property of Messrs. F. C. Calvert & Co., of Manchester, England.

On motion, it was resolved that the Secretary be requested to tender the thanks of the College to Messrs. F. C. Calvert & Co., of Manchester, England, for their very valuable and acceptable gift to the College, at the close of the Centennial Exposition, consisting of carbolic acid and its various compounds, together with other chemicals.

The committee appointed by the College to attend the annual meeting of the American Pharmaceutical Association, made the following report :

To the Philadelphia College of Pharmacy :

The delegates appointed to attend the annual meeting of the American Pharmaceutical Association respectfully report that they attended to the duties assigned them, some of their number being present at all of the sessions held.

The usual routine of business was pursued, and many interesting papers were read, eliciting approbation from those present.

A large number of members were in attendance, consequent in part upon the Centennial Exposition.

The Committee of Arrangements selected by the Association, in conjunction with a similar committee appointed by this College, arranged a social entertainment, in which most of the members of the Association present, with their ladies, participated. It was a thoroughly enjoyable affair, and passed off in a manner reflecting credit upon the good taste of the committee.

A drive throughout the Park, for the entertainment of the visiting ladies, and an excursion to the Switchback were also a part of the entertainment devised by the committee.

Invitations were received by the Association from the officers of the Union League, Zoölogical Garden, the Academy of Natural Sciences, Masonic Temple and other places of interest, for members of the Association to visit their several institutions, all of which were accepted with thanks.

The Centennial Exhibition seemed to claim much of the attention of members from a distance.

Your delegation had the honor of having its chairman, Mr. Bullock, elected to the post of President of the Association during the ensuing year.

The Association adjourned to meet in September next at Toronto, Canada.

Signed, W. J. JENKS,
On behalf of the delegation.

September 21st, 1876.

Prof. Maisch, on behalf of the committee appointed to attend the Conference of the Pharmaceutical Colleges, made a report as follows :

To the Philadelphia College of Pharmacy :

The delegates appointed to attend the Conference of Schools of Pharmacy respectfully submit the following report :

The seventh Conference of Schools of Pharmacy was held in the library of the Philadelphia College of Pharmacy on the evenings of September 11, 12 and 13, three sessions being held altogether. All Colleges of Pharmacy in the United States, conferring the degree of Graduate in Pharmacy, were represented. Delegates were accredited from the Chicago, Cincinnati, Louisville, Maryland, Massachusetts, New York, Philadelphia and St. Louis Colleges, and Professor Emlen Painter of the California College of Pharmacy was invited to take a seat and participate in the deliberations.

Mr. Chas. A. Tufts of the Massachusetts College was elected President and John M. Maisch of the Philadelphia College, Secretary for the ensuing year.

The questions submitted for discussion by the Philadelphia and Louisville Colleges were as follows :

1. Can a progressive course of lectures be suggested, differing from that followed in most Colleges of Pharmacy, and if so, what branches and in what order should they be taught?—or is it advisable to adhere to the present system, extending perhaps, the sessions; and to require junior students to pass an examination before they may be regarded as second-course students; and in the latter case what amount of knowledge should be demanded at the junior examination?

2. Is it advisable to make one or more courses of practical instruction obligatory as part of the regular course of instruction in pharmacy, and if so, to what extent should such a course embrace analytical chemistry, preparation of chemicals, preparation of pharmaceuticals and extemporaneous pharmacy?

The first session was devoted principally to the discussion of the first question, and a general interchange of views on this subject was had, the experience and observations made by the different Colleges being related. That a graded course is preferable to the present system of teaching was admitted; also, that such a graded or progressive course must ultimately be adopted. But to effect such a change at once was, in the judgment of the delegates, unfeasible, though the object to be attained should be continually kept in view.

The questions were finally referred to special committees for elaboration, and their reports formed the basis for discussion and action at the subsequent sessions.

The committee on the first query submitted a scheme for a progressive course, as follows :

FIRST, or ELEMENTARY COURSE.

1. *Chemistry*—Physics as applied to Chemistry; Chemical Philosophy; General properties of the elements and their compounds; General review of the groups of organic compounds.
2. *Pharmacy*—Physics as applied to pharmacy; manipulations; extemporaneous pharmacy.

3. *Botany and Materia Medica*—Morphology, histology and organology : systematic botany ; description of medicinal herbs and flowers.

SECOND, or ADVANCED COURSE.

1. *Chemistry*—Systematic Chemistry, both inorganic and organic.
2. *Pharmacy*—Pharmaceutical Chemistry and its application to the various processes.
3. *Materia Medica*—Special pharmacognosy.

It was the opinion of the committee that, while such a course of instruction was very desirable, the time had not yet arrived when it could be successfully introduced in all the Colleges ; a practical substitute would under the present system of instruction be found

1. In the increase of the number of lectures, whereby the lecturer can devote more time to the elementary subjects ; and

2. In holding annually an examination of the first-course students, such examination to be optional with them ; and thus stimulating them to further study and preparation for the second course. These examinations might embrace such subjects as would be embraced in the elementary course referred to.

The report was freely discussed in its various bearings, and a resolution was then passed recommending to the Colleges the introduction of such first-course examinations, with the request to report to a future conference on the success of the same.

The committee on the second query reported as follows :

" Believing that the grand aim and object of establishing schools of Pharmacy was to furnish the public with able and skillful exponents of the science, and that to secure this end, *practical* instruction is of the highest importance ; and whilst the didactic system of teaching is undoubtedly useful [experience having proved it], yet they would recommend a practical course of instruction which would so instruct the student that he would be prepared to stand an examination embracing questions which would compel him to have sufficient knowledge of analytical chemistry to qualitatively determine a ' Pharmacopœia ' chemical ; of the preparation of such chemicals as can readily be produced in a retail pharmacy ; of the preparation of any pharmaceutical preparation of the ' Pharmacopœia,' and so thorough an acquaintance with extemporaneous pharmacy that he would have no difficulty in producing creditable specimens of skill in the various branches of this portion of science before a competent board of examiners ;

" And they do further recommend that as a practical plan to stimulate the acquisition of this kind of pharmaceutical knowledge, the student be required, as part of his examination, to prepare himself, before the professors and examining committee, suitable evidences of his practical knowledge."

After a full interchange of views the Conference passed a resolution recommending to the Colleges to establish laboratories for the practical instruction in chemistry and pharmacy ; and then adopted the report of the committee, with the view of recommending the practical examinations.

A query referring to the advisability of subjecting pharmaceutical students to a preliminary examination previous to admitting them to the College courses, was introduced and after some discussion laid upon the table, the same question having been disposed of by the conferences of 1870 and 1873.

Questions relating to matriculation, the procuring of lecture tickets and other routine business of the Colleges were discussed to some extent, with the view of securing uniformity by all institutions.

The Colleges of New York and of California were selected to prepare questions for consideration at the next Conference, and after resolving that the eighth Conference convene at ten o'clock on the morning preceding the first session of the twenty-fifth meeting of the American Pharmaceutical Association, the Conference finally adjourned.

JOHN M. MAISCH.
JOSEPH P. REMINGTON.
ROBERT BRIDGES.

This being the semi-annual meeting, an election for eight trustees and a Committee on Deceased Members was ordered.

Samuel S. Bunting and Wm. B. Webb, acting as tellers, reported the following gentlemen elected to fill the positions for one year, viz. :

Trustees—Dr. Wilson H. Pile, William C. Bakes, William McIntyre, Albert P. Brown, Edward C. Jones, Richard V. Mattison, Robert England, A. W. Miller.

Committee on Deceased Members—Charles Bullock, Alfred B. Taylor, Joseph P. Remington.

There being no further business then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary*.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

BRITISH PHARMACEUTICAL CONFERENCE—THE MEETINGS AT GLASGOW.—

It may appear to be but a repetition of what has been said in former years to announce that the latest meeting of the British Pharmaceutical Conference, held at Glasgow on Tuesday and Wednesday, September 5th and 6th, has been at least as successful as that of any former year. But this is not a mere formal statement. Glasgow pharmacists may even boast of having been able to secure for this year's scientific meetings larger and more evenly sustained audiences than have supported the readers of papers on any previous occasion, whilst it is no wonder that, with the beauties of the Clyde, to say nothing of other inducements, they were able to tempt a large company to take part in the excursion. But to the serious business first.

The Executive Committee was again able to present a favorable report, showing an income during the year in excess by about £240 of the expenditure, including the cost of the Year Book and the grants in aid of research. With respect to this latter branch of the operations of the Conference, we are informed that the Executive Committee has made the following fresh grants: £5, extended, if necessary, to £10, to Mr. J. C. Thresh, F.C.S., for the purchase of materials in connection with an extended research on the active principle of capsicum fruit; £10 to Dr. Armstrong, F.R.S., for the purchase of strychnia, etc., with which to conduct a research on the oxidation products and bromo derivatives of that alkaloid; £20 to Dr. Tilden, F.C.S., for the purchase of essential oils, and £50 to Dr. C. R. A. Wright, F.C.S., Mr. J. Williams, F.C.S., and Mr. T. B. Groves, F.C.S., to defray expenses in connection with extended researches on the aconitines.

The President's address amply justifies the cordiality with which it was received. In it Prof. Redwood sets forth in an extremely clear and definite manner his views respecting the position that can be taken justifiably by pharmacists, in respect to giving advice as to the use of the drugs they handle daily, and this portion of the address forms a valuable contribution to the literature of a subject which has been too frequently discussed under a cloud of self-interest. Good service in another direction is done by the interesting illustration of our comparative ignorance respecting much of the history of the *Materia Medica*, and there can be no doubt that the suggestion as to the application of some of the scientific energy and the funds of the Conference for the testing and comparing of results already obtained by various investigators, if effectively carried out, would at least clear the ground of some of the confusions and contradictions with which it is now covered. During the reading of the address the large room of the Royal Hotel was filled with an evidently much interested audience, nor was the President less successful when in inviting discussions upon the several papers, he showed in a few lucid and suggestive sentences the bearing which each had on pharmacy.

Twenty-eight papers were read. In the first, Mr. B. S. Proctor described the strength of four samples of liquid extract of *pareira* as varying between one and six. This result he attributed to the vagueness of the words "coarse powder," used for indicating the degree of comminution, although it might well be due to the crude

materials not having had an identical origin. During the discussion, the President expressed an opinion in favor of a clearer definition of the degrees of fineness of powders in the next edition of the "British Pharmacopœia." The next note was by Mr. Stoddart, on the action of hydrochloric acid on the coloring matter of *Crocus sativus* in the presence of sugar. Five papers on opium followed. Mr. Dott, induced by variations he had met with in the morphia strength of opium preparations, expressed himself strongly in favor of the use of definite chemical principles instead of crude drugs; Messrs. Proctor and Cleaver gave some valuable information respecting the assay of opium; Dr. Wright described his continued research on the opium alkaloids, and Mr. Brown announced the presence of free acetic acid in opium. Next, the use of gum tragacanth and glycerin for a pill excipient was advocated by Mr. Welborn; afterwards Mr. Haffenden described his method of making phosphorus pills. Jaborandi this year furnished but one paper, that in which Mr. Gerrard described the action of various solvents upon "some salts of pilocarpine;" these he appeared to look upon as compounds of the alkaloid to which Mr. Kingsett recently attributed a definite formula, but Mr. Kingsett hardly acquiesced in the assumption. The next paper, by Dr. Wright, showed that with respect to the aconite alkaloids also, there still exists considerable haziness. In the last paper read on Tuesday, Mr. Thresh gave some further information respecting the active principle of capsicum fruit, and described some painful physiological experiments he had performed upon—himself.

The second day's proceedings opened with Mr. Kingsett's fourth report on the oxidation of essential oils, a research which the author indicates will probably eventuate in the manufacture commercially of a valuable antiseptic. Mr. Muir made a preliminary report on oil of sage. A preliminary report was also made on the chemistry of ivy by Mr. Davies. Dr. Tilden summarized the results obtained from the administration of the varieties of aloin to patients in the Bristol Hospital, an account of which has already been published in this Journal. Mr. Andrews suggested a formula for a glycerinum cinchonæ. Mr. Gerrard recommended the substitution of Canada balsam for the resin and suet in the B. P. cantharides plaster, which he considers to be insufficiently adhesive and flexible. Mr. Brown proposed a solution of citrate of iron and quinia, to be preserved by addition of chloroform. Such an addition, however, was generally disapproved of, and it was stated that a strong solution could be kept without it. Mr. Howie now submitted to the Conference the importance of deciding what should be considered the standard strength of the compound syrup of the phosphates. Mr. Greenish described the constituents met with in various filtering papers, and exhibited a specimen of Japanese filtering paper, prepared from the liber tissue of the paper mulberry (*Broussonetia papyrifera*). Three papers had for their subject salicylic acid. In consequence of the impurities met with in commercial salicylic acid, and the difficulty experienced in purifying by recrystallization, salicylate of soda prepared from it, Mr. Williams' attention has been turned to the sulphosalicylate of soda. This salt gives, with perchloride of iron, the purple color characteristic of salicylic acid, from which Mr. Williams infers that the salicyl radicle remains in it unchanged. Mr. Hunter has confirmed, by fresh experiments, the antiseptic properties of salicylic acid. Some experiments, made by Mr. Bengier, to ascertain the condition in which salicylic acid is excreted

by patients, seemed to indicate that it then was no longer in an active or uncombined state. Mr. Siebold sent two papers, one on the preparation of a pure sulphur præcipitatum by only partial precipitation; the other, on the strength of tincture of nux vomica. Mr. Groves exhibited a specimen of so-called Pekoe "Flower," concerning the origin of which Mr. Greenish contributed some information. This was the last of the papers.

The Conference then proceeded to the election of officers. Prof. Redwood was re-elected President, and it was decided to accept an invitation to meet next year at Plymouth. Enthusiastic votes of thanks to the Local Committee and to the President closed the proceedings.

On Tuesday evening an interesting gathering took place at the Royal Hotel, where many visitors to the Conference sat down to supper with a large number of the junior pharmacists of the city. The Chairman, in a few well-chosen words, introduced successively to his young friends the representative pharmacists present, and they in their turn addressed the company. The plain speaking of Prof. Redwood will no doubt be relished in many quarters, and equally disliked in others.

Soon after 6 o'clock on Thursday morning, pharmacists and their friends began to make their way to Glasgow Bridge, near where the *Eagle* lay at her moorings. By 7, a numerous company was on board, and to the music of the band and the pipers of the Cameronian Regiment, the boat made her way down the Clyde to the western coast, visiting successively the beautiful lochs that lay in her way. If anything could have repaid the Local Committee for their unbounded kindness during the whole meeting, it must have been the manifest appreciation on the part of their visitors of this crowning hospitality. And when the company met in the cabin after dinner, there could be no mistaking the enthusiasm with which they toasted the health of their hosts, and especially of those upon whom the work had principally fallen—Messrs. Davison, Frazer, Kinninmont, Stanford and Fairlie.

We have but little space left to speak of the other meetings of the week, but we must not omit to call attention to the admirable address with which on Wednesday evening Professor Andrews inaugurated at the Glasgow University the meeting of the British Association for the Advancement of Science. It is true that one of the local journals ventured to stigmatize it as "bald disjointed chat about science," unsuited for a Glasgow audience; but we venture to say that the motive for such an attack must be sought for outside the address itself. At any rate, the passage where Dr. Andrews speaks of the clouds of smoke which darken the atmosphere of our manufacturing towns, and even of whole districts of country, as indications of waste arising from imperfect combustion, and alludes to the depressing effect of this atmosphere upon the working population, is a passage which appears to us to be worthy of the particular attention of the citizens of Glasgow. The remarks of Dr. Andrews respecting the endowment of research are well worth pondering. He is not so enthusiastic as some are as to the benefit to be derived from endowing a body of men devoted exclusively to scientific research, without the duty of teaching or other occupation, and he confesses that after careful consideration he fails to discover how such a plan could be worked so as to secure the object in view. Moreover, he thinks that great injury would be done by thus separating the influence of the master intellects of the country as teachers from the flower of its youth.

On Friday morning a meeting of the newly-formed Chemists and Druggists' Trade Association was held in the Royal Hotel, Glasgow, when it was announced that the society now numbers twelve hundred members. A Secretary and Solicitor have been appointed. The society aspires to be thoroughly representative and claims the support of the whole trade. Some of the speakers pointed out that a difficulty in this respect had prevented the Pharmaceutical Society from exercising protective functions. The task which the Association undertakes is that of uniting the trade in regard to trade interests, and thus supplementing the efforts of the Pharmaceutical Society and Conference.—*Phar. Jour. and Trans.*, Sept. 9th, 1876.

EDITORIAL DEPARTMENT.

THE LAST MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION was as well attended as had been expected, over 400 members having been present altogether, many of them accompanied by their ladies and other members of their family. The great attraction was the International Exposition in Fairmount Park, and the local committee, keeping this in view, had, after mature deliberation, decided to recommend that two days of the week be devoted to visiting the Exposition, a number of members, well acquainted with it, having volunteered to act as guides, and the resident ladies to show the same courtesy to the lady visitors. The number of visitors who availed themselves of these offers was not as large as appeared desirable for their own convenience, and this was in a great measure due to the visiting members living at different hotels and private houses, and to their inability to meet the guides at the designated places upon the Exposition grounds. Many of the exhibitors had very obligingly offered to open, on this occasion, the cases under their charge, and thus afford an opportunity to better inspect the drugs and chemicals. Later in the afternoon, on Wednesday, about one hundred met by appointment, at the German restaurant, located within the enclosure, for dinner, and all returned to the city at an early hour to rest somewhat from the fatigue, and be prepared for the reception which was tendered to the Association by the druggists, manufacturing chemists and pharmacists of Philadelphia and vicinity.

St. George's Hall had been selected for this entertainment, at which over 800 persons were present. An address of welcome was delivered by the local secretary, Dr. A. W. Miller, and without any other formality those present enjoyed themselves, forming new acquaintances and renewing old ones. The capacious dining rooms of the building being insufficient to hold the throng, the entire company could not, at the same time, partake of the refreshments provided; but while a portion did ample justice to the good things upon the table, the others enjoyed themselves with dancing to the excellent music discoursed by Hassler's orchestra, many remaining until a late hour.

On Thursday three sessions were held by the Association, and while the evening session was in progress a party of ladies, unfortunately smaller in consequence of the rain than would otherwise have been the case, enjoyed themselves in the main hall of the College, which, from the numerous living plants and flowers, had the gay appearance of a sub-tropical garden. A piano had been provided, and instrumental and vocal music was the order of the evening until it became necessary to return home, regardless of the continuing rain.

Friday was devoted by smaller parties to visit the various places from which invitations had been received; the Masonic Temple, Fox's Glass Works and the Zoological Garden were inspected; but to many the Exposition proved to be the stronger attraction.

On Saturday afternoon, at 2 o'clock, nearly two hundred ladies, accompanied by

the committee on entertainment, started from the College building in carriages, for a drive through Fairmount Park, entering it at Green street and passing over Girard Avenue bridge to Lansdowne and George's Hill, at the foot of which the exhibition grounds are located, affording an excellent bird's-eye view of this locality, and further in the distance of the beautiful banks of the Schuylkill river, with a portion of Philadelphia in the back-ground. The drive was resumed to Belmont, the Schuylkill re-crossed at the Falls, and the romantic valley of the Wissahickon entered and followed up to near Indian Rock. On the return the party passed through a portion of the East Park to Strawberry Mansion, where a collation was served; night had set in when the excursionists returned to their city homes.

The incessant rain on the following Sunday, September 17, made that day one of rest; but upon the following morning the sun rose upon a cloudless sky, and about ninety ladies and gentlemen went on the excursion to Mauch Chunk, passing first through a fertile rolling country to Bethlehem, from whence the road follows the tortuous windings of the Lehigh river, the valley becoming continually narrower, so that there is scarcely any room left there, besides what is occupied by the tracks of two railways. In the mean time the sky had become overcast, a drizzling rain fell occasionally and the atmosphere was quite chilly, so that the warm rooms of the Mansion House were quite inviting. After dinner the weather had become sufficiently stationary to venture on the trip to the Switch-back, first in coaches through Mauch Chunk, which is located in a narrow ravine, and up a steep hill to the foot of Mount Pisgah. From here the car is drawn up an inclined plane to a height of 864 feet from its starting point, and a foot path brought the party then to a still higher point, where, from a rustic pavilion, a beautiful view was had over mountain tops, into wild ravines and through a portion of the narrow Lehigh valley. Re-entering the car, it dashes along an inclined plane, propelled by its own gravity, a distance of six miles to the foot of Mount Jefferson, to the top of which, 462 feet high, it is again pulled by a stationary engine, thence to descend again through the force of its own gravity to the mining village of Summit Hill, located at an elevation of 975 feet above the Lehigh river. Here the "burning mine" and the "ice cave" were visited. The former has been burning since 1843, and, though filled in and closed soon after, smoke still issues from the ground, several acres of which are scorchingly hot and vegetation upon it totally blighted. Within the distance of less than a quarter of a mile is the cave in which, during the winter, large quantities of ice are formed, much more than even the prolonged high temperature of the past summer could melt.

The descent from Summit Hill is made solely by the gravity railroad, often at a dizzy speed along high cliffs and around short curves; and after again reaching Mauch Chunk the inclement weather forbid a visit to Glen Onoko, and a return to Philadelphia on the same evening was decided upon. A delay of the train would have caused some unpleasant inconvenience if the forethought of the entertainment committee had not, by telegraph, provided for substantial refreshments at Bethlehem.

On Tuesday, September 19, between 40 and 50 members with ladies, embarked on a steamer for a visit, down the Delaware river, to Greenwich Point, in the southern part of Philadelphia, where a branch of the works of the Pennsylvania Salt Manufacturing Company are located. The officers conducted the visitors over the grounds and through the buildings, and gave all facilities for inspecting the processes, as carried on here, of manufacturing sulphuric acid, carbonate and bicarbonate of sodium, caustic soda, alum and so-called concentrated alum. A trip to League Island, and, after returning to the city, a pleasant intercourse at the office of the company closed this day's proceedings, the last one in which the visitors to the 24th annual meeting participated.

At a meeting of the visitors to Greenwich Point, Prof. E. Painter, of San Francisco, was called to the chair, and Prof. John M. Maisch, of Philadelphia, elected Secretary. Messrs. Chas. S. Eastman, of New Hampshire, and R. V. Mattison, of

Pennsylvania, having been appointed a committee, reported the following preamble and resolutions, which were unanimously adopted :

WHEREAS, Those members of the American Pharmaceutical Association, and their ladies, who have this day visited the works of the Pennsylvania Salt Manufacturing Company, located at Greenwich Point, have, with pleasure and great profit to themselves, examined the various processes carried on there; Therefore, be it

Resolved, That we tender our hearty thanks to the officers and managers of the Pennsylvania Salt Manufacturing Company for their courtesy and many facilities extended to us in showing and explaining the conversion of the crude materials into the finished products of their manufacture;

Resolved, That we feel greatly indebted for the generous hospitality of the officers, and for their kindness in placing a steamboat at our disposal for an excursion down the Delaware river to Greenwich Point and to League Island.

The joint committee, on arrangement, have held a meeting since the adjournment of the Association, and, though the accounts could not then be completely settled, it was ascertained that several hundred dollars would remain in the Treasurer's hands. It was unanimously determined that the surplus left should be invested, and then presented to the American Pharmaceutical Association, as the foundation of a fund, the interest of which should be expended solely for the purpose of aiding original investigations.

In conclusion, we may be permitted to say that the members of the joint committees have spared no labor to make the sojourn of their brethren here as pleasant and profitable as possible, and that the entertainment committee had perfected all the arrangements entrusted to their special care in a praiseworthy manner, which, we feel sure, is heartily appreciated by all who were present.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Beiträge zur Lehre über den Sauerstoff-Bedarf und die gährungs-erregende Fähigkeit der Hefepilze. Von Dr. Adolf Mayer. Heidelberg: Carl Winter's Universitäts-Buchhandlung, 1876. Large 8vo, pp. 27.

Contributions to the Knowledge on the Requirement of Oxygen and the Fermentative Capability of the Yeast Fungi.

The pamphlet is issued by the author as an addition or appendix to his "Chemistry of Fermentation," and while it reviews briefly the various views held by different investigators on this subject, bases the arguments on the older experiments and the modifications and perfections of the methods of investigation adopted by Brefeld, as published in 1874. Through his critical comparisons, the author arrives at somewhat different conclusions, which, however, appear to be well founded, as far as light has been thrown upon this difficult subject. We may condense his results in the following:

1. The breathing of oxygen is not necessary for the cellular growth of all groups of low organisms.
2. The growth of the beer yeast fungus, in the absence of oxygen, is insignificant, and the occasional admission of oxygen is necessary.
3. The continued absence of oxygen causes a cessation of its growth, but not of its vitality, unless
4. This absence continues for a sufficient length of time, when all vitality ceases.
5. A continued excessive supply of oxygen causes the fungi to vegetate, without inducing fermentation; usually, however, the same individuals sustain fermentation and vegetate in consequence of a moderate supply of oxygen.
6. Fermentation may be viewed as a sort of substitute for oxygen breathing; it is induced to a greater extent by vital cells, the more the supply of oxygen is limited, keeping in view the possibility of an organism to retain its vitality for some time through fermentation alone and with the total exclusion of oxygen.

The conditions of successful alcoholic fermentation as they have been found out by practice, it appears to us, are contained in the conclusions drawn by the author under No. 2 and the last half of the fifth deduction.

Tables for Systematic Qualitative Chemical Analysis. By John H. Snively, Ph.D., Professor of Analytical Chemistry in the Tennessee College of Pharmacy. Nashville: C. W. Smith, 1876. Price, \$1.

The views of teachers are apt to differ on the methods and means for instruction, and still good results may be obtained. Our partiality for analytical tables like those of Will, or the more condensed ones found in Attfield's Chemistry, does not preclude a good opinion for tables arranged on a different plan; those named, however, we regard as much more convenient than the tables now before us.

Analytical chemistry deals with facts well ascertained as far as examined, and upon such facts depends the treatment to which an unknown compound is subjected in order to ascertain its composition. A student of analytical chemistry can, therefore, work intelligently only if he has a thorough knowledge of the behavior of the individual compounds, and the composition and behavior of the precipitates obtained in a systematically performed analysis becomes, for these reasons, of great importance. The happy combination of such essentials makes the admirable work of Prof. Attfield so valuable to a student who has but a limited knowledge of chemistry when he enters a chemical laboratory.

The Hot Springs of Arkansas, as they are. A History and Guide. By Chas. Cutter. Hot Springs, Ark., 1876. 8vo, pp. 88. Price, 50 cents.

A new edition of the pamphlet noticed in this journal, 1874, p. 447.

Ready Reference List for Physicians. By Rich. J. Dunglison, M.D. Philadelphia, 1876. 8vo, pp. 54.

Besides advertisements, it contains the Hippocratic Oath, directions for treating the apparently drowned, and tables on poisons and their antidotes, on doses, approximate measurements, weights and measures.

State Hospital for the Insane, Danville, Pa.

The annual report for the year 1874-75, by the Superintendent, S. S. Schultz.

Thirty-third Annual Report of the Managers of the State Lunatic Asylum, Utica, N. Y. Albany, 1876.

This report for the year 1875 was transmitted to the Legislature in January of the present year.

The reception of the following reprints is respectfully acknowledged:

Specimens of Milk from the Vicinity of Boston. By S. P. Sharples, S. B.

A contribution towards our knowledge of the variations in the composition of milk.

Scheele's Green, its Composition as usually prepared, and some Experiments upon Arsenite of Copper. By S. P. Sharples, S. B.

The composition of pure Scheele's green is probably $\text{Cu}_3\text{As}_2\text{O}_6 \cdot 2\text{H}_2\text{O}$; but it is almost impossible to obtain a perfectly constant product, from the strong tendency to form basic sulphates and arsenites.

Contributions from the Laboratory of the (Missouri) State University. Part I. Determination of Baryum. By Prof. P. Schweitzer, Ph.D.

This is the first of a series of essays on the various methods of separating and determining barium, strontium and calcium, and treats of the determination of barium as sulphate, chromate, carbonate, silicofluoride and oxalate.

An Address on some of the leading Public Health Questions, with Remarks on the Extent of Swamp Lands in the United States and their Reclamation as a Sanitary and Economic Measure. By J. M. Toner, M.D.

The address was delivered before the American Public Health Association, at its third annual meeting, at Baltimore, November 9th, 1875.

A Report on Dermatology. By Prof. Lunsford P. Yandell, Jr., M.D.

Read before the Kentucky State Medical Society, April, 1876.

A Clinical Lecture on the Use of Plastic Dressing in Fractures from Lower Extremity. By Prof. David W. Yandell, M.D.

From the "American Practitioner," of July.

Orthopedic Surgery: Deformities of the Lower Extremities. By Van S. Lindsley, M.D.

Read before the Medical Society of Tennessee, April, 1876.

A Plea for Principles and Conservatism in the Treatment of Diseases peculiar to Females. By Prof. Wm. Abram Love, M.D.

From the Atlanta "Medical and Surgical Journal," July, 1876.

Sulphate of Cinchonidia a Substitute for Sulphate of Quinine. By Prof. J. W. Compton, M.D.

Read before the Kentucky State Medical Society, April, 1876.

On Strictures of the Male Urethra, its Radical Cure. By Prof. Fessenden N. Otis, M.D.

On the Treatment of Incipient Stricture by Otis' Operation. By Prof. Berkeley Hill. Together with Explanatory Remarks on the Treatment of Stricture and Gleet. By Prof. F. N. Otis.

From the London "Lancet," April 8, June 3 and June 10, 1876.

OBITUARIES.

ROBERT P. SOUTHALL, a native of Virginia, died at Washington, D. C., August 26th, at the age of 40 years. He had practised pharmacy for over 21 years, principally in Richmond, Baltimore and Washington.

FRANCIS S. GAITHER died suddenly at Washington, D. C., on the evening of September 12th, from hemorrhage of the lungs, at the age of 40 years. He was born in Georgetown, D. C., and learned and practised his profession in Washington, where he became a charter member of the National College of Pharmacy, in which he was elected to the chair of Theory and Practice of Pharmacy, but, his health failing, was compelled to resign. His studies were mainly devoted to pharmaceutical chemistry.

THE AMERICAN JOURNAL OF PHARMACY.

NOVEMBER, 1876.

ON THE SEEDS OF RICINUS COMMUNIS.

BY EMIL LOUIS BOERNER, PH.G.

(From an Inaugural Essay.)

The acrid principle of ricinus seeds is but in a slight degree extracted in the expression of the oil, and the residual marc, as left by the manufacturer of castor oil, would, therefore, contain the greater portion of it, and was the material operated upon.

The coarse particles, which were liable to interfere with percolation, being rejected, four different portions, of 1,000 grains each, were treated respectively with gasolin, bisulphide of carbon, ether, and alcohol, until exhausted; the various menstrua evaporated, and the residues weighed, yielding from gasolin 6.9 per cent.; bisulphide of carbon, 11.77 per cent.; ether, 14 per cent., and alcohol, 21.2 per cent. The first three appeared to be pure oil, and were of a light yellow color, while the alcohol residue was much darker, and contained considerable coloring matter, which was deposited upon standing.

The marc which had been exhausted with gasolin was further treated with bisulphide of carbon, resulting in an additional 5.37 per cent. of oily residue from which, after a few days' standing, acicular crystals separated, which were insoluble in gasolin, partly soluble in ether, and in alcohol. A second attempt to obtain the crystals was unsuccessful. That portion of marc which had been treated with bisulphide of carbon yielded nothing to gasolin upon subsequent treatment with this menstruum.

A portion of exhausted marc was macerated with water until decomposed, requiring for the process about fourteen days. It was then strained, to separate coarser particles, and distilled; the distillate, having an acid reaction and an odor resembling that of decayed cheese, was treated with carbonate of zinc and filtered; upon concentration of the filtrate, crystals of butyrate of zinc separated. Both crystals and

mother-liquor, when shaken with sulphuric acid and alcohol, immediately developed, in a marked degree, the odor of butyric ether. A portion of this ethereal liquid neutralized with ammonia, was unaffected by the addition of ferric chloride, thus indicating the absence of an acetate.

An experiment was made similar to the one of Prof. Tuson, in which he found a crystallizable substance supposed to be an alkaloid.

A portion of the marc was boiled with successive portions of water, the several liquids strained through muslin, and the resulting decoction evaporated to the consistence of a soft extract, which was exhausted with boiling alcohol. Upon standing, a substance of a resinous appearance, but soluble in water, separated from the filtrate, and was removed by a second filtration. The filtrate was concentrated, and, as no crystals separated, magnesia was added, the mixture evaporated to dryness, again exhausted with boiling alcohol, and filtered, when, upon concentration and a few days' standing, colorless crystals, having the form of rectangular prisms and tables, separated, answering to the appearance of those obtained by Prof. Tuson. These crystals were slowly soluble in hot water. In an acidulated solution of the crystals, phosphomolybdic acid, tannic acid and iodohydrargyrate of potassium produced neither a precipitate nor a coloration; while in the mother-liquor precipitates were at once formed by the two first-named reagents, but by the last one only after some hours, and in amount about one-eighth that formed by phosphomolybdic acid. The mother-liquor, when heated with solid hydrate of potassium, developed the odor of ammonia. From these the writer concludes that the crystalline substance in question is not an alkaloid.

A substance resembling emulsin was obtained by forming an emulsion of the marc with water, adding an equal bulk of ether, and agitating repeatedly during twenty-four hours, when, upon standing, the liquid separated into two layers; the supernatant liquid being removed, alcohol was added to the other, which precipitated the emulsin. This emulsin, with amygdalin, in the presence of water, developed the odor of hydrocyanic acid after several days' standing. The result of Mr. H. Bower ("*Amer. Jour. Pharm.*," 1854, p. 208) is confirmed by this experiment.

The residue obtained from the alcoholic percolate having deposited a semi-solid portion, largely composed of coloring matter, was agitated with ether, which took up the oil. The part left undissolved by the

ether was treated with successive portions of alcohol until but a few grains were left; this, containing a number of minute crystals, and having a very sweet taste, was dissolved in water. The application of Trommer's test proved the presence of sugar. A drop of the aqueous solution, placed on a microscope slide, and evaporated, plainly revealed the presence of cane sugar.

As the best authorities agree in placing the amount of fixed oil obtained from the kernels of the seeds at less than 50 per cent., it would seem that, as more than 11 per cent. is obtainable from the marc as rejected by the manufacturer by treatment with bisulphide of carbon, the latter oil could be produced at a less cost than an inferior quality of the expressed article, and answer the same purpose for use in the arts.

The writer intends making further experiments to determine the amount of butyric acid obtainable from the marc, by a process similar to the one above described.

SIUM LATIFOLIUM,

(*Water Parsnip, nat. order Umbellifera, Gray.*)

BY NATHAN ROGERS, PH.G.

(*Abstract from an Inaugural Essay presented to the California College of Pharmacy.*)

Attention having been recently directed to this plant (see "Amer. Jour. Phar.," 1873, p. 371), the writer concluded from its stated marked poisonous properties to subject the plant to a chemical examination.

The water parsnip is an aquatic plant very common in the swamps and along the water courses of the valleys of the Pacific slope. Its root is creeping,¹ stem erect, angular, leaves pinnate, leaflets ovate, lanceolate, sessile smooth, serrate, sometimes pinnatifid; flowers white, large rayed, involucre many-leaved, umbels terminal. The leaves of the plant, when found growing in water, are generally bi-pinnatifid. In appearance, growth, odor and taste it is closely allied to its innocent congener, the *Pastinaca sativa*. On account of this resemblance, it has frequently been productive of dangerous results, when eaten through mistake for the harmless and nutritious tuber of that edible species.

¹ This statement does not agree with the brief description given by Mr. A. R. Porter on page 349 of this volume. The root examined by the latter had been sent by Dr. C. B. White, U. S. A., to Mr. F. B. Power.—EDITOR.

The root being considered the most active part of the plant, it was deemed proper to subject that part to a chemical examination.

A portion of the root, cut up fine, was introduced into boiling water, contained in a retort, and a volatile oil obtained, which had a light-straw color, neutral reaction and possessed a pungent odor, resembling somewhat the peculiar odor of carrots. A cold infusion of the fresh root, acidulated with hydrochloric acid, and filtered, to separate a precipitate, failed to give a precipitate with iodo-hydrargyrate of potassium; but when distilled with an excess of potassa solution, a perfectly clear and colorless distillate was obtained, possessing a strong alkaline reaction and a peculiar mouse-like odor, somewhat similar to that of conium; after neutralization with hydrochloric acid, however, not the slightest precipitate was occasioned by phosphomolybdic acid, iodo-hydrargyrate of potassium or potassium cadmic iodide.

The neutralized distillate was next concentrated on a water-bath, and then allowed to evaporate spontaneously over sulphuric acid, which resulted in the deposition of long, slender, colorless needle-shaped crystals. On the addition of milk of lime a peculiar alkaline volatile principle was instantly liberated from its combination, and distinctly recognized by its disagreeable mouse like odor, and the property of restoring the blue color to reddened litmus.

Following Wittstein's process for preparing pastinacina, the alkaline distillate was freed from the volatile oil, neutralized with sulphuric acid, evaporated and treated with etherized alcohol to remove ammonium sulphate, the filtrate evaporated to a syrupy consistency and distilled with solution of potassa, gave a distillate which possessed an alkaline reaction, a urinous odor and a pungent taste. After neutralizing with sulphuric acid, needle-shaped crystals were obtained. This *alkaloid* appears to be analogous to pastinacina.¹

A spirituous tincture of the root was mixed with water, and the alcohol and volatile oil distilled off; the dark reddish-brown resin removed from the aqueous liquid was soluble in ether and alcohol, and produced in the throat an unpleasant, burning sensation. Weak ammonia dissolved from this *two acid resins*, which were precipitated, the one by acetate, the other by subacetate of lead. The portion insoluble in ammonia consisted in part of an *indifferent resin*. It was dissolved

¹ Wittstein's pastinacina has an insignificant (unbedeutend) and scarcely somewhat acrid (scharf) taste. See "Buchn. Repertorium," vol. 68, p. 18.—EDITOR.

in alcohol, precipitated by a spirituous solution of lead acetate, the precipitate decomposed by sulphuretted hydrogen, and the sulphide of lead treated with boiling alcohol, from which, on cooling, shining colorless needles of a neutral principle separated, which were insoluble in pure and acidulated water, but soluble in ether, and from platinum foil volatilizable without charring. The aqueous filtrate from the resin obtained above was evaporated, and the residue incinerated; the ashes contained salts of *potassium, sodium, calcium* and *magnesium*.

On examining a section of the root under the microscope, *starch granules* were found to be quite plentifully around the medullary sheath and near the cortical portion. They polarized but feebly, were oblong, different in size and quite small. *Sugar, albumen* and *gum* were found in the cold infusion by appropriate tests.

Medicinal Effects.—From experiments made upon dogs, the volatile alkali and the neutral crystallizable principle were both found to be perfectly inert, while the resinous mass, in ten-grain doses, was found to lessen the frequency and the force of the heart's beat, producing also dizziness, vomiting and purging, with slight convulsive movements. These poisonous symptoms having gradually disappeared, the animals were left in a prostrate, weakened condition, from which they slowly recovered.

San Francisco, Cal., February 10th, 1876.

ON THE ROOT OF EUPHORBIA IPECACUANHA.

EY PHILIPP H. DILG, PH.G.

(Abstract from an Inaugural Essay.)

The author collected the root in New Jersey late in September, and on repeating some of Mr. Petzelt's experiments (see "Amer. Jour. Phar.," 1873, p. 256) did not obtain any reaction for glucose until after the decoction had been boiled with an acid.

The alcoholic extract obtained by spontaneous evaporation was of a light-brown color and contained some crystals; ether extracted from it some oil and waxy matter, and a compound, which, on evaporation from petroleum benzin, yielded clusters of radiating crystals.

On percolating the root with petroleum benzin and evaporating the menstruum, a yellow tenacious mass, intermingled with thin colorless needles, was obtained. This benzin extract was completely dissolved by chloroform and bisulphide of carbon, the latter solution being tur-

bid; ether dissolved it partially, leaving a white flakey residue, and alcohol acquired a yellow color without affecting the shape of the extract, which appears to consist mainly of caoutchouc. From the alcoholic solution a warty crystalline mass was obtained, which responded to the test for euphorbon as given by Flückiger (*"Pharmacographia,"* p. 504).

The author did not succeed in isolating the emetic principle, and in concluding his essay, he states that only two houses in this city quote *Euphorbia ipecacuanha* in their price lists, but one only had it in stock, charging for it 75 cents per pound. On examining a dozen price lists from eclectic druggists in different parts of the country, one from Boston was the only one quoting it, and from that house a package was obtained, marked *Euphorbia Americana*, but containing the root of *Gillenia stipulacea*.¹ If it was ever used to any extent, the drug has evidently become obsolete and might well be dropped from the *"Pharmacopœia."*

GENTIAN ROOT SAID TO CONTAIN TANNIN.

BY JOHN M. MAISCH.

In a paper published in the March number of this journal (p. 117-121), the writer has discussed the question, whether gentian root contains tannin, and from his experiments and the investigations of others, arrived at the conclusion that tannin is entirely absent, and that the inky coloration, occurring on the addition of ferric chloride to a strong infusion of gentian is due to gentianic (gentisic) acid and to the presence of a body producing a dark green fluorescence.

A brief abstract of the paper, giving the principal results, has found its way into the *"Pharmaceutische Centralhalle"* of July 13, and is there accompanied by a statement from Dr. Hager, of which the following is a translation:

"Gentian root is collected from different species of *Gentiana*. It is therefore explainable that one sample may be free from tannin, while another may contain it. This observation has been repeatedly made in the preparation of Hager's quinia and iron pills; hence the remark in Hager's *"Phar. Praxis,"* vol. II, p. 23: 'the roots of some of

¹ Our experience has been similar to that of Mr. Dilg; several years ago we were unable to find this root in the market, and on several occasions were supplied with the root of *Gill. stipulacea*.—EDITOR.

the mentioned species of gentiana contain also iron blueing tannin." It must not be surprising if pills containing iron with gentian are obtained from one apothecary's store of a brown, and from another of a black mass."

On referring to the new work by Hager, we find only the brief statement quoted above, without any further indication as to the observations upon which the conclusion is based. The species mentioned as yielding some of the commercial root are *G. purpurea*, *Lin.*, *G. pannonica*, *Scopoli*, and *G. punctata*, *Lin.*, the same species which are usually enumerated in works on materia medica as being sometimes collected with *G. lutea*, *Lin.* Since they appear to have been medicinally employed for a long time, one being even officinal in Austria, it would seem surprising that the presence of tannin in one or the other should not have been observed before. If the variation in color of pills containing a salt of iron, and prepared with extract of gentian, has led Hager to the above statement, it seems to be precisely as correct to assume that the extract had been prepared from a carelessly collected gentian root, in which the presence of some foreign astringent root had been overlooked.

The root of *Gentiana crinita*, *Froel.*, which had been collected last year near Philadelphia, is free from tannin, and the same must be said from a root very similar in appearance, and which was received from North Carolina as the root of *G. Catesbæi*, *Walt.* We are therefore, it seems to me, justified to regard the medicinal gentian roots as being free from tannin, until positive proof to the contrary is produced.

ON SYRUP OF LIQUORICE ROOT AND BROWN MIXTURE.

BY A. P. BROWN, PH.G.

(Read at the Pharmaceutical Meeting October 17th.)

A short time ago, having occasion to make some ammoniacal glycyrrhizin, it occurred to me that the use of ammonia in preparing syrup of liquorice root would be an advantage, I therefore devised the following formula :

Take of Liquorice root,	4 troyounces
Cold water,	q. s.
Water of ammonia,	1 fluidounce
Granulated sugar,	13 troyounces.

Grind the root in a mill, and place it in a wide-mouth bottle, with a

tightly-fitting stopper, pour upon it one pint of water, mixed with the water of ammonia, macerate for forty-eight hours, then transfer it to a funnel and allow the liquid to drain from it, and add sufficient water until two pints of liquid has passed; allow it to stand until the particles have subsided, then decant and evaporate to eight fluidounces, filter and, having added the sugar, dissolve it with the aid of heat.

Experiments were made with the ordinary liquorice root and the Russian peeled root, and of the two the syrup made from the Russian root is decidedly the finest. The cortical portion of liquorice root is acrid, without possessing the peculiar virtues of the root, the Russian root, being deprived of the epidermis, will, of course, make the best preparation.

The syrup thus prepared is of a dark-brown color, and contains all the sweet principles of the root without the starch and other inert matter. It is used to mask the bitterness of quinia, and is well adapted for children.

Sulphate of magnesium, iodide and bromide of potassium lose most of their taste when mixed with this syrup.

I have prepared brown mixture from liquorice root and ammonia by the following process:

Take of Liquorice root, . . .	4 troyounces
Water of ammonia, . . .	1 fluidounce
Water, . . .	q. s.

Proceed in the same manner as for syrup of liquorice root, but instead of evaporating to eight fluidounces, evaporate to twelve fluidounces, and mix this with the gum arabic, sugar and other ingredients. Lastly, add water of ammonia until a clear solution is obtained, taking care not to add an excess.

Brown mixture, prepared by the above process, is of a brownish-yellow color, and almost entirely free from sediment.

MIXTURES OF QUINIA AND AMMONIA.

BY WILLIAM MCINTYRE, PH.G.

(*Read at Social Meeting of Alumni Association of the College of Pharmacy, Oct. 5, 1876.*)

While quinia and ammonia are incompatible, an excess of the latter will determine a solution, and a pharmaceutical preparation of this character is not an impossibility.

Several formulæ have been published, and with the view of calling renewed attention to the subject, they are re-produced.

Liquor quiniæ ammoniatus (Bastick).

Take of Sulphate of quinia thirty-two grains;
Alcohol, 49 per cent., three and a half fluidounces;
Water of ammonia, half a fluidounce.

Diffuse the quinia in half the spirit, add ammonia to the remainder, and mix all together.

Tinctura quiniæ ammoniata (Ince).

Take of Sulphate of quinia, thirty-two grains;
Alcohol, 49 per cent., three and a half fluidounces;
Spirit of ammonia, half a fluidounce.

The increased alcoholic strength is considered an improvement by the author.

Liquor quiniæ ammoniatus (Squire).

Take of Sulphate of quinia, thirty-two grains;
Stronger water of ammonia, one fluidrachm;
Alcohol, 49 per cent., sufficient to make four fluidounces.

Mix as in the first formula.

Tinctura quiniæ ammoniata (Curtis).

Take of Quinia (alkaloid) thirty-two grains;
Aromatic spirit of ammonia, four fluidounces.

The quinia will readily dissolve in the spirit, and the strength of the preparation can be increased, if desired.

These solutions are permanent; with water they make turbid mixtures, and are too pungent to be taken undiluted.

NOTE BY THE EDITOR.—The following, which is taken from Squire's "Pharmacopœias of the London Hospitals," agrees with the three first formulas in quinia strength, but is notably stronger in ammonia and alcohol.

Liquor Quiniæ Ammoniatus.—Sulphate of quinia, twenty-four grains; strong solution of ammonia, four drachms; rectified spirit (sp. gr., 838) to three ounces. Dose, 30 to 60 minims.

PRACTICAL NOTES.

The following notes are gleaned from some of the essays presented to the Philadelphia College of Pharmacy last spring:

Lactate of Iron.—Instead of the officinal ferrous lactate, Louis P. Carbonell recommends the ferric lactate, which he succeeded to obtain in

light-brown transparent scales by following the process for the other scale preparations of iron, taking particular care to fully saturate the acid and to avoid high temperature during the whole operation. If the first precaution be overlooked, a more or less pasty mass will be the result, and if the temperature rises too high, a pulverulent salt will be obtained.

The scaled salt is freely soluble in water and alcohol.¹

Lactate of iron and quinia and *lactate of iron and strychnia* may also be obtained in brown scales, have a bitter ferruginous taste and are soluble in alcohol and water.

Phytolacca.—Oliver P. Hooper gives the following formulas for preparations of the poke :

Tinctura phytolaccae baccae concentrata.

Take of Poke berries, dried,	℥xvi
Alcohol	Oii

Macerate for 14 days at a temperature of 90° F., express and filter. Dose for an adult, half a teaspoonful.

Alcohol extracts none of the red coloring matter, and the above tincture has a brown color like tincture of aconite root. The writer had known the tincture of poke berries employed with success in chronic rheumatism, in doses of about twenty drops, and combined with compound syrup of sarsaparilla and small doses of potassium iodide and wine of colchicum.

Tinctura phytolaccae radiceis composita.

Take of Poke root, ground,	℥vi
Cardamom, powdered,	℥ii
Diluted alcohol,	Oii

Macerate for 14 days and filter. Dose, as an alternative, 10 to 20 minims.

Unguentum phytolaccae radiceis.

Take of Fresh poke root,	℥ii
Lard	℥i

Bruise the root until of a uniform pasty consistence, and mix with the lard. Has been recommended in scalled head and similar diseases.

The root roasted in hot ashes until soft, and then mashed and applied as a poultice, is unrivaled in felons and humors of various kinds.

Cream of Camphor.—Charles Griffith offers the following formula for

¹ Ferric hydrate dissolved in warm lactic acid, according to Wittstein, is gradually in part reduced to ferrous salt. According to Berzelius, ferric lactate is insoluble in alcohol.—See "Gmelin's Chemistry."—EDITOR.

a liniment, which is applicable in cases similar to those in which volatile liniment is used :

Take of Castile soap, . . .	℥iss
Water of ammonia, . . .	f℥iss
Camphor, . . .	℥vi
Oil of turpentine, . . .	f℥vi
Chloride of ammonium, . .	℥iss
Water, . . .	f℥xii

Dissolve the soap shavings in one-half the water previously mixed with the ammonia, and the ammonium chloride in the other half; mix the solutions well, and add the camphor dissolved in the turpentine; then agitate briskly until the liquids are united and form a perfect emulsion.¹ Other active medicines may be added when indicated.

SOLUBILITY OF IODIDE AND BROMIDE OF AMMONIUM IN ETHER.

BY E. M. WELLS, PH.G.

During an investigation, I observed that iodide of ammonium is soluble in ether. Being desirous to know the extent of its solubility, I examined several standard works, but found nothing written on the subject. "Gmelin's Chemistry" (edition 1872) merely states that the salt is very deliquescent and easily soluble in water and alcohol, and similar statements are met with in other works.

From the results of the determinations as given below, it seems that both iodide and bromide of ammonium are not insoluble in pure ether, and that their solubility increases very considerably as the ether becomes weaker through the presence of alcohol.

An excess of the respective salts was put into a flask with a quantity of ether, and allowed to stand several hours, and was well shaken at short intervals. The temperature was from 60° F. to 65° F. The ethereal solutions were carefully poured in a tared beaker, well covered and weighed, then set aside to evaporate to dryness and re-weighed.

The results of the several experiments are given in the following table:

Grs. of Ether, sp. gr. '715.	Grs. of Ether, sp. gr. '742.	Dissolved grs. Iodide of Ammonium.	Dissolved grs. Bro- mide of Ammon.	Per cent.
'218	. . . .	'5	. . . . .	'22
'225	. . . .	. . . . .	Amount very small	
	'345	'9	. . . . .	'60
	'249	. . . . .	'5	'20

¹ For a formula for a similar preparation see "Am. Jour. Phar.," 1875, p. 257 — EDITOR.

GLEANINGS FROM THE DANISH JOURNALS.

BY HANS M. WILDER.

Enameled Iron Pots.—Werner-Cronquist and Eggertz found until 38 per cent. lead in the enamel. In a pot of 8 cubic inches capacity was boiled, for $3\frac{1}{2}$ hours, 450 grams vinegar (10 per cent.), and yielded 0.014 grams lead.—*Arch. for Pharm.*, '76 p. 248, from *Hygiea*, 1876.

Blaud's Pills.—Aé recommends to keep on hand a mixture of ferri sulphas 15 parts, potass. carb. 15 parts and sugar 3 parts. If pills are prescribed to be made, for instance, from 15 parts each of sulph. ferri and pot. carb., 33 parts of the above mass is taken and made into pills with about 6 parts powdered marshmallow root. Pills thus made keep their shape and are easily digested.—*Ibid.*, p. 256, from *Arch. d. Ph.*

Whether Trees have been Cut at the Right Season.—Prillieux recommends iodine, which colors the cross section of trees cut in winter time yellow, with blueish-black lines. Trees cut at any other season will only be colored yellow by iodine.—*Ibid.*, p. 289, from *Dingler*.

Pharmacopœia Danica.—The second supplement contains the following additions: Acid. salicylic, bals. styrax, caffeina, iodoform; of preparations: Aqua chamomillæ concentrata. 100 parts recently distilled chamomile water are mixed with 2 parts alcohol, and therefrom distilled 10 parts. Likewise elder-flower water and linden-flower water.—*Ibid.*, p. 299.

Pure nitrogen.—Knapp produces it in short time and in quite considerable quantities by slightly heating a concentrated solution of 53.5 chloride of ammonium and 69 nitrate of sodium.—*Ibid.*, 356, from *Buchner*, 1876, p. 5.

THE DIFFERENT SYRUPS OF THE PHOSPHATES IN GENERAL USE.

BY ERNERT C. SAUNDERS.

The difference in the quality and strength of different samples of the preparation known as Parrish's Chemical Food, as found in the market at the present time, has been the subject of considerable discussion during the past few months, but as, with the exception of Mr. W. L. Howie in his useful and practical paper, all seem to have devoted their energies more to finding out faults in ordinary samples of the preparation than to remedying them, I venture to submit the following re-

marks on this article, and the somewhat similar one of Easton's Syrup, which is also difficult to make and to keep in good condition. I begin with Parrish's Syrup as perhaps the most difficult to make according to the ordinary formula.

The chief reason for the difference met with in the various makes of this preparation is to be found in the fact that the principal published formula, that in Parrish's "Pharmacy," is an utterly unpractical one. It is well known that glacial phosphoric acid, uncontaminated with phosphate of soda, is hardly to be found in the market at present; but even if it were, it is next to impossible to obtain a good preparation with it, as it is a monobasic acid, while the direction to add "quantum sufficit" of hydrochloric acid is exceedingly vague. But apart from this, it is evident that the formula cannot be strictly followed, as if the quantity of ferrous phosphate directed to be present in each fluidrachm of the completed syrup is attended to, 32 troyounces of sugar will have to be made into 36 fluidounces of syrup—a manifest impossibility; while, if the quantity given as the amount of solution to be formed for the sugar to be dissolved in is adhered to, the result will be about 46 fluidounces of syrup, which will not contain the requisite amount per drachm of iron and lime. All the formulæ at present in use seem merely modifications of that given by Parrish. In the following form the author has only followed Parrish as far as the result to be obtained is concerned, viz., that the finished syrup shall contain in each fluidrachm 1 grain ferrous phosphate $\text{Fe}_3\text{P}_2\text{O}_8$, $2\frac{1}{2}$ grains calcic phosphate $\text{Ca}_3\text{P}_2\text{O}_8$, and traces of sodic and potassic phosphates, with free phosphoric acid.

Take of	Iron wire, clean, No. 20,	240 grains;
	Syrupy phosphoric acid (sp. gr. 1.75),	3 oz. by weight;
	Water, distilled,	4 fluidounces.

Mix the acid and water, and dissolve the wire in the mixture in a flask, loosely stopped with tow; the hydrogen evolved then protects the solution from oxidation. When all action has ceased, heat to boiling point, and filter through paper in a funnel with a long neck reaching to the bottom of a beaker containing a little syrup, which floating on the iron solution will effectually prevent any oxidation.

Slaked lime, fresh,	923 grains;
Phosphoric acid (sp. gr. 1.75),	9½ oz. by weight;
Water, distilled,	14 fluidounces.

Mix the acid and water, and dissolve the lime in the mixture. Filter the solution.

Crystallized sodic carbonate,	54 grains;
Potassic carbonate,	72 grains;
Phosphoric acid (sp. gr. 1.75),	$\frac{1}{2}$ oz. by weight;
Distilled water,	1 fluidounce.

Dissolve and filter. Then mix all the solutions, and, having added distilled water to make the solution measure 28 fluidounces, dissolve in it with heat sugar, $3\frac{1}{2}$ lb.; powdered cochineal, 85 grains; and strain while hot. When cold, add orange-flower water, 2 fluidounces, and sufficient distilled water to make the whole measure 64 fluidounces. The product is a nice clear syrup, entirely free from sulphate of soda or ammoniac chloride, both of which are by no means uncommon impurities, from the difficulty of washing the precipitates when the syrup is made in the old way, while the whole process will be found very much less troublesome and tedious. Calcic hydrate is generally sufficiently pure as commonly obtained, though where the chemist has the facilities for doing it, it is best for him to make the lime himself, by igniting precipitated chalk in a crucible, at a full red heat, for an hour.

I may remark here, though it does not exactly bear on the subject, that the last edition (1872) of Pereira's "Materia Medica" contains the astonishing information, on page 213, that "Hypophosphite of lime is an important constituent in Parrish's Chemical Food;" a statement that is liable to mislead physicians in a serious manner.

Easton's syrup is another preparation that is frequently badly made, and very often deficient in iron. The precipitate so frequently met with, in the form of phosphate of quinia, is, I think, always owing to the use of an acid containing metaphosphoric acid. I have never been troubled with a precipitate since I have taken pains to use only orthophosphoric acid, H_3PO_4 . The change in color is due to exposure to the air, chiefly from oxidation of the iron salt, but partly to the quinia changing color. It may be entirely avoided, as has been often remarked, by completely filling the bottles in which the syrup is kept, and corking so as to have as little air left in the bottle as possible.

No trouble will be found in making a satisfactory preparation if the following form be strictly followed, and care taken to avoid exposure to the air of the iron solution.

Take of	Iron wire (No. 20),	.	.	.	240 grains
	Phosphoric acid (sp. gr. 1.75),	.	.	.	3 oz. by weight
	Water,	.	.	.	4 fluidounces

Dissolve with the precautions directed above in the formula for Parrish's syrup.

Quinia sulph.,	.	.	.	.	62½ grains
Liq. ammon.,	.	.	.	.
Distilled water,	.	.	.	.
Dilute sulphuric acid,	.	.	.	.	ad q. s.

Precipitate the quinia, secundum artem, and wash on a filter with a pint of very cold distilled water, press strongly, and dissolve in half an ounce, by weight, of phosphoric acid, diluted with an ounce of water in which 16 grains of strychnia have been dissolved. Mix with the solution of iron, add enough distilled water to make the whole measure 10 fluidounces, and mix thoroughly with 54 fluidounces of simple syrup. The resulting syrup will contain in each fluidrachm 1 grain ferrous phosphate $\text{Fe}_2\text{P}_2\text{O}_7$, 1 grain quinic phosphate $(\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_3)_2\text{H}_3\text{PO}_4$, and $\frac{1}{2}$ grain of strychnia.

These two syrups afford good examples of two classes of syrups that present considerable difficulties in manipulation with the formulæ in general use, which, I think, are quite removed in the two just submitted. both have now been tested on a large scale for some time, and found very satisfactory in their products. No originality is claimed in the use of metallic iron in place of precipitated ferrous phosphate; it was, I believe, first suggested by Mr. W. H. Jones, in the columns of the "Pharmaceutical Journal." The chief point that I would press, is the importance of using tribasic (ortho) phosphoric acid, H_3PO_4 ; both metaphosphoric acid, HPO_3 , and pyrophosphoric acid, $\text{H}_4\text{P}_2\text{O}_7$, if present in the acid to even a small extent, are certain to cause trouble. The precaution given as to filtering the solution of ferrous phosphate will be found useful in many other cases; a beakerful of solution of ferrous iodide filtered in a similar manner, with a layer of syrup the eighth of an inch thick floating on the surface, can be left exposed for 24 hours without injury to the solution. It is, of course, necessary that the solution should have the greatest specific gravity.—*Pharm. Journ. and Trans.*, July 15, 1876.

THE VARIATION IN STRENGTH OF THE OPIUM PREPARATIONS.

BY D. B. DOTT.

In the following communication, the subject of which is one of those suggested for investigation by the Conference, I give the results of an examination of a number of the official opium preparations. It was not thought necessary to test samples of all these preparations, but only of the tincture, extract, and liquid extract; the morphia-strength of which will probably afford a sufficiently accurate idea of the quality of the opium preparations at present supplied to the public. All the samples examined were procured from druggists of good standing in London, Dublin and Edinburgh.

In the first place I give the assays of a variety of opiums, with the amount of extract obtained from each. The percentage of extract was not found directly, but by subtracting the percentages of water and insoluble residue from 100, the difference being the percentage of dry extract. The proportion of the morphia in the extract is calculated from the result of the opium assay.

It will be seen from this table that the richest extract obtained would contain 34.4 per cent. of morphia, while the poorest would contain 13.7 per cent. Whence it is manifest that two chemists, starting with opiums perfectly answering the "Pharmacopœia" tests, and strictly following the official process, might succeed in preparing extracts, one of which would be more than twice the strength of the other.

Description of Opium used.	Morphia per cent.	Water per cent.	Aqueous extract per cent.	Residue insoluble in water per ct.	Morphia in extract per cent.
1. Turkey	10.75	19.6	47.80	32.60	22.4
2. "	12.30	20.0	51.15	28.85	24.0
3. "	10.20	26.0	48.05	25.95	21.2
4. "	7.57	21.2	54.90	23.70	13.7
5. "	9.60	22.0	47.05	30.95	20.4
6. "	11.69	18.4	56.15	25.45	20.8
7. "	12.30	19.2	54.90	25.90	22.4
8. "	12.30	20.4	45.40	34.20	27.0
9. "	6.76	27.2	37.00	35.80	18.2
10. "	9.80	21.2	40.00	38.80	24.5
11. "	8.85	22.8	47.50	29.70	18.6
12. "	6.93	31.2	20.10	47.90	34.4
13. Persian	6.00	14.0	59.20	26.80	10.1
14. "	8.50	12.0	60.60	27.40	14.0
15. "	2.10	16.0	58.10	25.90	3.6
16. " in sticks	traces	15.6	73.90	10.50	traces
17. Malwa	7.30	15.2	60.70	24.10	12.0
18. "	5.80	13.6	61.10	25.20	9.5
19. Egyptian	7.00	14.8	56.90	28.30	12.3

In the next table I give the estimation of several samples of *Extractum Opii*.

	Water per cent.	Morphia per cent.		Morphia per cent.
No. 1	19'2	19'4	No. 7	22'8
No. 2	21'2	19'7	No. 8	19'3
No. 3	26'8	16'2	No. 9	20'5
No. 4	18'4	19'6	No. 10	15'4
No. 5	23'2	19'7	No. 11	20'4
No. 6	22'0	18'2	.	.

The difference between the maximum 22'8 and the minimum 15'4 is equal to a variation in the morphia-strength of about 3 to 4½. The average percentage is 19'7.

I next give a list of the samples of *Extractum Opii Liquidum* examined, with their specific gravities and the amount of morphia in the fluidounce.

No.	Spec. Grav.	Grs. Morphia in fl. oz.			No.	Spec. Grav.	Grs. Morphia in fl. oz.		
		I.	II.	mean			I.	II.	mean
1	0'987	3'82	4'08	3'95	9	0'985	4'68	4'34	4'51
2	0'992	4'02	3'95	3'98	10	1'000	4'17	4'01	4'09
3	0'986	2'66	2'87	2'76	11	0'989	3'68	3'75	3'76
4	0'993	3'04	3'89	3'46	12		3'71		
5	0'996	3'73	3'12	3'42	13		2'28		
6	0'995	2'26	2'06	2'16	14		0'61		
7	0'992	1'78	1'63	1'66	15		2'22		
8	0'996	4'33	2'34	4'33					

It will be observed that in these fifteen samples the grains of morphia in the fluidounce varied from 0'6 to 4'5, the average being 3'12. Only one estimation of the last four was made, as these were examined some months ago, without any intention of publishing the results. In one or two cases it would have been advisable to repeat the determination of the morphia, but the quantity of each sample admitted of only two estimations being made.

In the following table I give the assays of eighteen samples of the *Tinctura Opii*, with their specific gravities.

No.	Spec. Grav.	Grs. Morphia in fl. oz.			No.	Spec. Grav.	Grs. Morphia in fl. oz.		
		I.	II.	mean			I.	II.	mean
1	'922	3'30	3'50	3'40	10	'960	3'50	3'57	3'53
2	'938	2'80	2'70	2'75	12	'953	3'04		
3	'955	2'10	2'10	2'10	11	'936	3'90		
4	'940	2'90	3'70	3'30	13		3'71		
5	'956	2'05	2'10	2'07	14		4'37		
6	'937	2'08	2'23	2'15	15		2'02		
7	'929	3'12	3'28	3'20	16		0'83		
8	'957	3'62	3'45	3'53	17		1'91		
9	'962	1'40	1'59	1'49	18		0'55		

In this, the most important of the opium preparations, the variation of morphia strength extends from 4'37 to 0'65 grs. in the fluidounce; the average being 2'66.

The method employed in all the above-noted assays is a modification of that recommended in the British "Pharmacopœia." I find that the precipitate of crude morphia obtained in that process is equal on an average to $\frac{7}{10}$ ths of its weight of the pure base. It is a process which I have every reason to believe gives at least as accurate results as those obtainable by any of the recognized methods.

I think the most obvious conclusion to be arrived at from the foregoing experiments, and from those of other observers, is that the opium preparations are not remedies to be relied on. When one considers that a physician who prescribes for his patient one drachm of laudanum, intending that the latter should receive thereby $\frac{1}{3}$ of a grain of morphia, may in reality be only giving him $\frac{1}{10}$ th of a grain, it is manifest that this indicates a condition of things demanding amendment. It has been proposed by Dr. Squibb (reported in the "Year-Book for 1870") to prepare a strong tincture, assay it, and then dilute to the proper strength, or at least to prepare the tincture, etc., from assayed opium. I am afraid, however, that there would be great, if not insuperable, difficulty in getting this system brought into general use. The trouble involved in following such a plan would deter the majority of pharmacists from adopting it. For my own part, I believe the ultimate solution of the difficulty will be the abolition of all the galenical preparations of opium from the "Pharmacopœia." Indeed, unless opium possesses therapeutical properties which are not possessed by its alkaloids, there can be no reason for retaining it. That is a question, of course, to be decided by medical men. Still, I venture to think that

our knowledge of the physiological effects of opium and its constituents is sufficiently complete to enable us to affirm that all the objects for which opium is prescribed can be attained equally well by the use of its alkaloids. Among these only three can be said to have any practical importance, viz., morphia, codeia and narceina, which are all hypnotics, and seem to differ from one another mainly in the amount required to produce the desired effect. The other bases are either inert in ordinary doses, or exist in such minute quantities that the proportion of them in a large dose of laudanum could only produce a physiological effect in the imagination of a homœopathist.

I believe that the chief work of pharmaceutical chemistry for a long time to come will consist in the perfecting of processes for the isolation of the active principles of the vegetable remedies, so that in due time all the mediæval tinctures and decoctions of the "Pharmacopœia" will become obsolete, and be superseded by preparations of definite and invariable strength. It is my sincere hope that this paper, meagre and imperfect though it is, may in some small measure be the means of hastening such a desirable consummation.—*Pharm. Jour. and Trans.* [Lond.], Sept. 16, 1876.

REPORT OF AN ASSAY OF OPIUM FOR MORPHIA.

BY EDWARD LAWRENCE CLEAVER, F.C.S.

In order to thoroughly criticize the different processes in present use for the estimation of morphia in opium it is necessary to have a thorough knowledge of the following points :

1. What are the constituents of opium ?
2. In what state of combination do they exist ?
3. The action of solvents and reagents on these principles.
4. The action of solvents on opium.
5. The action of alkalies on solutions of opium.
6. The action of heat, acids, etc., on morphia.

This paper will therefore be divided into two parts. The first consists of remarks on the foregoing heads ; the second of the application of these remarks to point out the advantages and disadvantages of the existing processes used for opium analysis.

PART I.—The principal constituents of opium are as follows : Morphia, narcotina, narceina, codeina, thebaina, papaverina, a substance

resembling caoutchouc, probably two resins, meconic acid and calcium salts, and a substance we will designate by the name of extractive.

Of these the morphia in all probability exists combined with the meconic acid to form soluble meconate of morphia.

The narcotina is either entirely free or partly combined with acid.

The remaining alkaloids are probably in a state of combination.

The meconic acid is partly free and partly combined.

The action of different solvents and reagents on the principles of opium are as follows:

Water (distilled).—Morphia is soluble to the extent of one part in 1,000; narcotina in 10,000; narceina is sparingly soluble though more so than morphia; the meconic acid is freely soluble; the resin, caoutchouc, etc., are insoluble.

Alcohol.—Morphia is sparingly soluble in cold alcohol, freely in boiling. The remaining alkaloids, resin and caoutchouc are soluble.

Fusel Oil.—All the alkaloids are freely soluble in fusel oil. The resin is also slightly soluble.

Ether, Benzol, Bisulphide of Carbon.—Morphia is soluble to the extent of one part in 2,000; the remaining alkaloids are freely soluble. The resin is insoluble; caoutchouc soluble.

Acids.—The whole of the alkaloids and resins are soluble in acids.

Fixed Alkalies.—Morphia is freely soluble in solutions of fixed alkalies, narcotina is insoluble. In the presence of morphia narcotina is dissolved by lime water; narceina is soluble. The remaining alkaloids are insoluble. The resin is partly soluble.

Ammonia.—Morphia is sparingly soluble in ammonia, a 1 per cent. solution dissolving five parts in 1,000. The narceina and codeina are soluble. The remaining alkaloids and resin are insoluble.

Action of Solvents on Opium.

It follows from the foregoing remarks that when opium is treated with water the solution contains meconate of morphia, salts of narcotina and other alkaloids; resin, taken into solution by the free acid present; calcium salts, meconic acid and extractive.

An alcoholic solution will, in addition to the above, contain more narcotina, caoutchouc, fat and resin.

The question here arises as to whether water will thoroughly exhaust the opium of its morphia. Opinions on this point are divided, but I

believe that, provided the solution produced be acid, water will effectually exhaust the marc.

It may be said that opium, after prolonged treatment with water, has a bitter taste, thus proving some constituent to be present; but that this bitterness is not due to morphia may be proved by treating the marc with benzol, ether or bisulphide of carbon, when the bitterness is entirely removed. Preliminary treatment with one of the above mentioned solvents is recommended by some authors, and this plan has the advantage that the quantity of water required for the after treatment of the opium is much less than if the preliminary exhaustion be omitted, and also that the narcotina being nearly all removed, the point of exhaustion is more easily noticed by the solution dropping through devoid of bitterness. It must, however, be remembered that a slight loss of morphia is entailed by the preliminary treatment, but the amount may be calculated by adding .005 gr. for every 10 cc. of solvent used to the amount of morphia afterwards found.

Hot water is also recommended by some, but I do not think much advantage is gained by its use, as the following experiment will prove:

No. 1. 100 grains of dried powdered opium were treated with hot water. It yielded 69 per cent. of extract and 12.2 per cent. of brown crystalline morphia.

No. 2. 100 grains of the same opium were treated with cold water by percolators; five fluidounces of water were used and then the solution had a very bitter taste. It yielded 54.3 per cent. extract and 11.9 per cent. of colored crystalline morphia.

No. 3. 100 grains were treated first with boiling benzin and afterwards percolated with water. It required under three ounces of liquid to render the marc tasteless, whilst in the previous experiment five fluidounces were required, and even then the solution obtained was slightly bitter. The liquid yielded 54.7 per cent. of extract and 12.2 of colored crystalline morphia.

It will be seen from these experiments that although hot water dissolves more from opium than cold water, yet the yield of morphia is not greater. The effect, however, of first using benzin is more marked, and the increased yield of morphia I believe to be due to the fact that less water being used, less time was required to evaporate the solution, and thus destruction of the morphia by heat is avoided. I also tried the

effect of mixing opium with chalk, and then adding water, and percolating.

100 grains of opium, as before, yielded 45 per cent. of extract, which gave 11.9 per cent. of brown crystalline morphia.

The difference in extract yielded by the plan is due to the fact that the free acid being neutralized by the chalk, the meconic acid, part of resin, the whole of the meconate of calcium, and part of narcotina, are removed from solution and so diminish the weight of extract obtained.

The results obtained by this process, compared with others, will be given further on.

Action of Alkalies on Infusion and Tincture of Opium.

Ammonia.—If excess of solution of ammonia be added to infusion of opium a precipitate is obtained, which consists chiefly of morphia, but contains small quantities of narcotina and other alkaloids, meconate of calcium and resin. This precipitate is either crystalline or amorphous, accordingly as a solution was hot or cold when precipitated. If the solution be concentrated until about equal to twice the weight of opium employed, and ammonia added to the boiling liquid, with constant stirring, the resin is precipitated, melts and adheres firmly to the sides of the containing vessel or to the glass rod used for stirring. The liquid can then be poured off immediately, when the morphia, etc., will begin to be precipitated owing to the change of temperature. The crystals so obtained are free from the resin and light-brown in color. The morphia is not entirely precipitated by ammonia from infusion of opium, owing to the solubility of morphia in water and in ammonia. If the ammonia be added in slight excess only, and the liquid allowed to stand until the smell of the ammonia has disappeared, then the amount of morphia left in solution should correspond to the amount of liquid used, unless there be any constituent in the infusion of opium which prevents the complete precipitation of morphia. This, according Prof. Dragendorff, is the case. The following experiments, however, tend to prove that, provided the excess of ammonia be nearly driven off, the amount of morphia left in solution is in direct accordance with its solubility in water.

6.48 grams of dried Turkey opium were exhausted with water, and concentrated to 35 cc. It yielded .800 gram of morphia. The solution, which with the wash water measured 70 cc., was shaken repeatedly with fusel oil; fusel oil removed and evaporated. The residue

was treated with dilute acid and precipitated with ammonia. This last operation was performed entirely with about 10 cc. of liquid. It yielded .067 gram of morphia, which with .010 to be added for loss of morphia in the 10 cc. of liquid, gave .077 or only .005 gram in excess of the theoretical quantity, which may be accounted for, as the morphia was not quite free from color.

Five grams of Persian opium treated as above yielded .460 gram of morphia, and 50 cc. of liquid was used. This, treated by amylic alcohol, gave .053 gram of morphia.

6.480 grams of a very rich sample of Persian opium gave .907 of morphia, 6.80 cc. of wash water were used. This, by treatment with amylic alcohol, yielded .087 gram of morphia.

There is, however, one point in connection with the precipitation of morphia by ammonia to which special attention must be paid. It is that solutions of opium from which the morphia has been precipitated by slight excess of ammonia, if left to stand until the smell of ammonia has disappeared, redissolve a large quantity of the precipitate, so that care must be taken that the liquid should always have a *slight excess* of ammonia present. It is, I believe, to the neglect of this fact that Prof. Dragendorff has made the statement that opium contains some ingredient which hinders the precipitation of the morphia.

When, however, ammonia in strong excess was allowed to remain in the liquid, the amount of morphia extracted by amylic alcohol was much greater, in one case as much as 3 per cent.

If the opium before treating with water has been mixed with chalk, then the precipitate obtained by ammonia consists of morphia, narcotina and resin, the meconate of calcium being entirely got rid of. If the opium has been treated with boiling benzin, bisulphide of carbon or ether, previous to infusion, then the precipitate consists of morphia, meconate of calcium, resin and minute quantities of other alkaloids. The following experiment will illustrate the difference in composition of the precipitate under these different circumstances.

No. 1. 6.480 grams of dried opium treated with cold water, the solution evaporated to half an ounce, ammonia added in slight excess and allowed to stand twenty-four hours, gave 1.695 gram of precipitate; of this 1.506 was soluble in boiling alcohol. The alcoholic residue, etc., treated with bisulphide of carbon, lost .358 gram. The remainder dissolved in dilute acid, and treated with slight excess of ammonia, yielded .870 gram of morphia.

No. 2. 6.480 grams mixed with chalk, and treated as above, gave 1.258 of precipitate by ammonia; of this 1.200 was soluble in alcohol, .267 soluble in bisulphide of carbon and .858 of morphia.

No. 3. 6.480 grams treated with bisulphide of carbon, and afterwards exhausted with water, yielded 1.332 gram of precipitate by ammonia, of which 1.137 was soluble in alcohol, and .008 in bisulphide of carbon and yielded .880 of morphia.

From this it will be seen—

	1	2	3	4
Precipitate by Ammonia,	26.06	19.6	20.5	18.3
Portion soluble in Alcohol,	23.08	18.5	17.2	16.1
“ “ C.S ₂	5.5	4.1	0.1	
Morphia contained in precipitate, . .	13.28	13.25	13.59	13.7

That a large quantity of morphia escapes precipitation by ammonia is a point strongly to be remembered, as in the case of a bad opium containing only from 2 to 4 per cent. of morphia, more morphia might remain in the liquid than was precipitated.

It has been proposed to take the weight of the precipitate given by ammonia as a criterion of the goodness of opium, and good opium should certainly not give less than 14 to 15 per cent. of it, but it should be borne in mind that it does not contain more than half its weight of morphia.

If ammonia be added to infusion of opium (which has been acidified with hydrochloric acid) until exactly neutral, the resin and meconate of calcium are precipitated, whilst soluble hydrochlorate of morphia remains in solution; the precipitate can then be filtered off and then ammonia be added to the filtrate in slight excess; a light-colored precipitate is obtained, which consists of morphia and narcotina in a very pure form.

Potash, soda and lime, added to infusion of opium, cause a precipitate of narcotina, and resin, and meconate of calcium, but the morphia is dissolved by the excess of alkali present. If the solution be filtered quickly the morphia soon separates out, and is in a very pure form, but there is some loss in the process, as I have never been able to recover by this means as much morphia as by other processes. Lime water also dissolves narcotina to some extent, provided morphia be present.

Action of Heat on Morphia.—If morphia or its salts be boiled with water for some time the solution becomes colored; if acids in excess

be present the action is more marked, whilst with alkalis the action is stronger still, and a flocculent-brown precipitate is soon formed. The following experiments may prove useful as showing that, provided allowance be made for the solubility of morphia in water, the precipitate is complete :

I took .583 gr. of pure morphia, dissolved in acid and treated with slight excess of ammonia. After twenty-four hours the precipitate was collected, dried and weighed ; it gave .552 gr. of morphia ; the wash water was 30 cc., equivalent to .030 of morphia, thus making the total .582 gr.

.113 gr. of pure morphia, treated as above, gave .100 gr. of precipitate and 13 cc. of liquid, which would correspond to .013 gr. of morphia, thus making the total .113.

Ammonia added to tincture of opium, or to an alcoholic solution of the precipitate produced by ammonia, produces a precipitate of part of the morphia and part of the narcotina present, the amount remaining in solution depending on the strength and quantity of the alcoholic liquid ; if the liquid be tincture of opium, then the precipitate contains meconate of calcium.

PART II.—In commencing my criticisms on the processes in use I will begin with the most simple, and then proceed to describe others more complicated.

Arnoldi's process (" Jour. Chem. Soc.," 1874). Opium is exhausted with water, the solution treated with animal charcoal, concentrated and precipitated by ammonia. The precipitate is collected, dried and weighed as impure morphia. The author states that good opium should yield above 14 per cent.

The objections are :

1. That the morphia is not entirely precipitated by ammonia.
2. That the precipitate, though called impure morphia, does not contain much more than half its weight of ammonia.
3. The use of animal charcoal ensures loss of alkaloid, as the under-mentioned experiment will prove :

2.435 grams of pure morphia were dissolved in acid and boiled with animal charcoal. The morphia was precipitated, and the amount obtained, allowing for loss by solubility, was 2.405 gr., thus indicating a loss of over 1 per cent.

A second experiment showed even a higher loss.

The process given by Professor Flückiger in the "Pharmacographia" is better, but far from perfect. It is as follows: Opium is exhausted by boiling ether, the residue dried, treated with water, and precipitated by ammonia. This precipitate recrystallized from boiling alcohol.

Professor Flückiger himself describes the process as imperfect, and gives his reasons. He is one of the very few who seem to have taken notice of the loss of morphia by virtue of its solubility and of its destruction by heat. The chief objections to the process are:

1. The long continued boiling with ether (twenty or thirty times repeated with fresh quantities) takes away some of the morphia, and care must be taken that the ether employed is free from alcohol and water.

2. The loss of morphia by virtue of its solubility.

3. In crystallizing from alcohol much morphia remains in solution, but the crystals deposited are very pure.

The small proportions of morphia found by Professor Flückiger tend to prove the correctness of these statements.

Guibourt's process ("Journal de Pharmacie et Chimie") consists in exhausting opium with water, precipitating by ammonia, and washing the precipitate first with dilute alcohol to remove narcotina and coloring matter, and afterwards dissolving the morphia by means of strong alcohol. The alcoholic solution is evaporated, dried and weighed.

The objections to this process are loss of morphia by washing the precipitate with dilute alcohol, and in the precipitation with ammonia.

The residue obtained by the evaporation of the alcoholic solution is not pure morphia, but contains narcotina and resin.

Schacht's process ("Archiv der Pharmacie," 1863). The process is an improvement on the last mentioned. It consists in exhausting opium with water by two or three macerations, treating with animal charcoal, concentrating, and adding ammonia. The precipitate is weighed, treated with ether, and the ethereal solution evaporated and weighed. The portion insoluble in ether is treated with strong alcohol, the alcoholic solution evaporated, dried and weighed; or it is washed with water and dilute alcohol and again weighed, the weight being taken as pure morphia.

This process has the following objections:

1. The amount of water used by macerating three successive times

necessitates long applications of heat for evaporating, which tends to destroy the morphia. The meconic acid present is also split up and forms other colored matters, which help to make the morphia impure.

2. The animal charcoal used retains alkaloid.

3. If the alcoholic solution be evaporated, the results are high, as it contains coloring matter and resin.

4. If washed with alcohol (dilute) and water, morphia is dissolved away.

5. No mention is made of the morphia lost in precipitating.

It is, however, the best of those processes in which water is used alone as a solvent, and by slightly modifying, as follows, can be made to produce very good results.

The solution from which the morphia has been precipitated by ammonia should either be measured and allowance made for the morphia dissolved, or it should be treated with amylic alcohol as before described.

1. The opium should be first treated with benzin, as by that means less water is required for exhaustion, and the marc should be percolated, not macerated.

2. The use of animal charcoal should be precluded, the morphia being purified by being dissolved in acid, made neutral, filtered, and then adding ammonia.

The process devised by Merck, consists in exhausting with water, and precipitating by means of carbonate of soda and heat. The precipitate is dissolved in acetic acid and made neutral, filtered, and excess of ammonia added.

This process has the following objections :

1. The alkali and heat cause destruction of the morphia.

2. No account is taken of the loss by precipitation. It has the advantage that the method of purification proposed avoids loss of morphia.

Guillermont's process consists in treating opium with alcohol, and adding ammonia to the alcoholic solution. The morphia so produced is very pure, but as a large quantity remains dissolved in the alcohol, it is only a comparative method. The precipitate also contains meconate of calcium.

The process of Staples, which consists in adding alcohol to concentrated infusion of opium, then after filtration mixing more alcohol and ammonia, is also open to the same objections as the last.

The process of Mohr which has been adopted, with slight modifications, by the compilers of the B. P., consists in exhausting opium with water, mixing with milk of lime and boiling; the filtered liquid is mixed with hydrochloric acid and concentrated. It is then made exactly neutral with ammonia, filtered, and mixed with excess of ammonia; the precipitate dried and weighed. This process, if properly and carefully carried out, is one of the best, as, by the use of lime, the resin and meconate of calcium, also meconic acid, is removed from solution. The objections to it are:

1. That the large quantity of water used and the subsequent evaporations cause loss of morphia.
2. That no account is taken of the loss of morphia by non-precipitation.

The modifications I would introduce are as follows:

1. The opium should be first treated with bisulphide of carbon or benzin.
2. The dried residue should then be mixed with its own weight of lime and two or three times its bulk of some inert powder, such as pumice or glass. It is then to be percolated with water, the first part of percolate being returned as fast as it runs through. By this means much less water will be required to exhaust the opium than would otherwise be the case. After the opium is exhausted, which will be known by the liquid dropping through devoid of taste, the solution should be exactly neutralized with dilute sulphuric acid and filtered and the precipitate washed. The clear solution is then to be evaporated over a water-bath until its bulk is about half an ounce, and again filtered if requisite; then ammonia is to be added in slight excess, and the liquid allowed to stand twenty-four hours. The precipitate can then be collected, washed with ether, and dried, and to the amount found must be added the amount corresponding to the quantity of water used in precipitating and washing. The morphia obtained by this process is of a dull white color, crystalline, perfectly soluble in alcohol, acids and alkalies.

. In concluding these few remarks, which I hope may prove useful, as indicating which methods are most likely to give correct results, I beg to state that I do not consider the subject in any way exhausted, and that I still intend to work upon opium analysis, and hope to communicate further results at another meeting of the Conference.

Table showing amount of morphia obtained by different processes on samples of dried powdered opium :

	Arnoldi.	Flückiger.	Guibourt.	Schacht.	Schacht Improved.	Guillemont.	B. P.	B. P. Improved.
Turkish, . . .	26	9'5	10'2	11'0	12'8	9'8	12'1	13'0
Persian, . . .	25	8'0	9'0	11'0	13'0	8'7	12'3	13'4
Indian, . . .	15	3'0	3'6	4'0	5'2	3'2	4'9	5'6

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Vanillin from Wood-tar.—Reimer observed a reaction which is common to all phenols, by which the latter are transformed into aromatic aldehyds. Phenol is mixed with chloroform and an excess of soda solution; after the reaction the excess of undecomposed chloroform is distilled off and an acid added, when salicylic aldehyd is produced, which may be purified by combining with sodium bisulphite and liberation by an acid. Guaiacol treated in the same way yields vanillin, the aldehyd of vanillic acid. Gorup-Besanez found (1867) guaiacol to be one of the constituents of beech wood-tar creasote.—*Phar. Cent. Halle*, No. 31.

To distinguish beech-tar creasote from coal-tar creasote, Professor R. Boettger recommends to dissolve one drop of the creasote in 40 cc. (10 fluidrachms) of distilled water, and add a few drops of a concentrated solution of ferric chloride. The appearance, after a few minutes, of a dirty brownish yellow coloration indicates the presence of Reichenbach's beech-tar creasote, while a faint blueish violet coloration is proof of the presence of carbolic acid.—*Phar. Cent. Halle*, No. 33.

The tansifuge properties of pumpkin-seed, according to Heckel, reside in the perisperm. Ferd. Vigier, however, states that the seeds lose nothing of their activity by being deprived of their perisperm, according to his experiments made with the seeds of *Cucurbita maxima*, which is the species most frequently met with in Paris. He prepares an emulsion from 60 grams of the seeds deprived of the perisperm, 20

of sugar, 10 of orange flower water and 160 of distilled water. This potion is to be followed by a purgative.—*L'Union Phar.*, June.

Bowdichia major, Mart., is a large tree of Brazil, where it is known under the names of sicopira, sebipira, subupira, etc. An exudation appears in the spring, and hardens to pieces resembling Senega gum. This sicopira gum was described by Peckolt in 1862, and contains besides 14 per cent. of moisture, 4 resin, 3 tannin, 31 gum and 44 of a bassorin-like substance. It is used in diarrhoea.

The soluble constituents of the wood are tannin, gum and resin. The trunk-bark contains much tannin and some of the constituents found in the root-bark. It was formerly employed medicinally, but has fallen into disuse, while the more active bark of the root, introduced by Dr. J. A. Vieira de Mattos, is successfully employed in Brazil in various skin diseases; it is given in the form of alcoholic extract, in doses of 0.15 gram, 3 to 6 times daily, and as alcoholic tincture (1 bark to 4 alcohol), by mixing 30 grams with 300 grams of syrup, in tablespoonful doses, repeated thrice daily.

Th. Peckolt, of Rio, describes the root-bark as either red-brown (sicopira vermelha) or flesh-colored (sic. branca), the latter coming chiefly from the Campos region, district of Serro, province of Minas Geraes. The latter is very difficult to obtain, but is preferred for medicinal use.

On treating the red-brown ethereal extract of the bark with cold alcohol of 32°, a fine crystalline mass of *sicopirin* is left behind, which has a bitter somewhat biting taste, is soluble in ether and boiling alcohol, but almost insoluble in water; when treated with diluted sulphuric acid it yields glucose. Prof. Geuther found its elementary composition to be $C_{16}H_{12}O_5$.

The fresh root-bark from the province of Rio de Janeiro yields only 0.019 per cent. of sicopirin. Peckolt found also 9.1 per cent. of bitter principle and extractive, soluble in alcohol and water, 8.88 per cent. of resins and smaller quantities of gum, starch, tannin and albumen.

The bark from the Campos region contains more sicopirin, and if this should prove to be the active principle, would obviously be more active than the red-brown bark.—*Zeitschr. Oest. Ap. Ver.*, No. 19.

The therapeutic value of the crystalline principles of aloes has been the subject of investigation, by Nelson C. Dobson and Wm. A. Tilden, who arrived at the following results:

Barbaloin, nataloin and zanaloin are more or less aperient in doses of two grains, barbaloin being, apparently, rather more active in combination with hard soap than with conserve of roses. They are, each of them, decidedly uncertain and variable in their action; the time which elapsed after the administration before there was any perceptible action varied from $2\frac{1}{2}$ to 15 hours. The crystalline principle did not appear to be more potent than a similar dose of aloes, nor was any advantage discovered over a similar dose of aloes, except, perhaps, that griping was less common than when aloes alone was given.—*Phar. Jour. and Trans.*, Aug. 19, from *Med. Times and Gaz.*, Aug. 12.

Adulterated Arrowroot.—H. Wm. Jones states that a considerable quantity of arrowroot, adulterated with cassava starch, is in the (English) market at the present time. Similar adulterations have been previously noticed in France, by Guibourt.—*Phar. Jour. and Trans.*, July 8.

Estimation of Quinia from Ferri et Quiniæ Citras.—A. N. Palmer observed that the quinia in this preparation cannot be reliably determined by ammonia and ether. But by employing chloroform as the solvent for the alkaloid, the whole amount can be obtained, even in the presence of sugar, glycerin or ammonium citrate. If ammonia is used for liberating the quinia, the liquid will show an alkaline reaction long before the whole of the quinia has been precipitated.—*Ibid.*, July 29.

A. J. Cownley, however, shows that the failure of ether to extract the whole of the quinia is, most likely, due to the solubility of this liquid and water, and that, practically, the whole of the quinia can be obtained if the liquid is repeatedly agitated with ether.—*Ibid.*, Aug. 5.

Soluble Prussian blue, in a durable liquid form, is obtained by dissolving 5 grams of ferrocyanide of potassium, 5 grains of iron potassa alum ($\text{KFe}_2\text{SO}_4 \cdot 12\text{H}_2\text{O}$) and 1 gram borax, in 200 grams of distilled water, adding 5 or 6 grams of pure diluted nitric acid, and afterwards 2 grams of liquor ferri sesquichlorati, "Phar. Germ." (spec. grav. 1.480 to 1.484; contains 15 per cent. of iron).—*Apoth. Zeit.*, No. 31.

Codliver oil with ferrous iodide is prepared by triturating in a mortar 1 part each of iodine and pulverized iron and 20 parts of codliver oil; the mixture is then heated in a water-bath until the brown color of the iodine has completely disappeared and given place to a deep purple

color, when 60 parts more of the oil are added, and the liquid, after standing, is decanted and kept in well-corked bottles sheltered from the light.

It differs in taste but little from the ordinary medicinal codliver oil. Exposed to the light, it changes after a few days to a red-brown color, indicating the liberation of iodine. Taste and color furnish a good criterion for its condition. It is well not to prepare too much in advance.—*Phar. Jour. and Trans.*, July 8th, from *Nieu Tydschr. voor de Phar. in Nederland*.

Colorless Tincture of Iodine.—Schönbein states that ammonium hypiodite is formed when iodine acts upon an excess of ammonia. The hypiodite reacting with alcohol produces iodoform in the same manner as chloroform is formed by the action of calcium hypochlorite upon alcohol. In preparing the colorless tincture from iodine, ammonia-water and alcohol, Wm. H. Darling has separated some iodoform, and attributes the efficacy of this tincture, for the most part, to the iodoform.—*Ibid*, July 15.

MEDICINAL GUM RESINS OF PERSIA.

Ammoniacum (Dorema Ammoniacum, Don.)

This resin is called *Uschekh* in Persia. The plant grows on plateaux and mountain slopes in the cold climate (Serdesir or Jeylak). I found it on the far-stretching plateaux between Mahiar and Yezdechast, especially between Aminabad and Yezdechast, where, together with some *Salsola*, it nearly covered the whole plain. But it also grows in an easterly direction from Ispahan, in the district of Ardistan, by the station Najin (on the route to Yezd). According to the authority of the inhabitants, it puts forth leaves and sprouts towards the end of March; the leaves develop quickly, dry just as rapidly, and serve as excellent food for sheep, which eat them with avidity. When I passed through the plateau on the 25th of June, 1859, I only saw fallen leaves, resembling those of celery, blown about by the wind. The stems, however, attain a height of about six feet, and I could easily reach the tops of them on horseback. The blossoming season was already over, but the sticky seeds were still young, round and full of sap (not flattened as at the end of the journey); above all, there were on the plants and tops small tears of gum resin. The bare stems, about one and a half to

two inches thick, which I cut through, were so full of resin that a thick sap ran over ; later on, after exposure to the air, it thickens and becomes of a yellowish-brown color. There are, however, some plants which give no gum and bear no fruit. The inhabitants call these male plants, while they term the fruit-bearing ones female plants. The maximum temperature on this day was 25°C . The saline well-water boiled at $94\frac{1}{2}^{\circ}\text{C}$. On my return journey, on the 1st of August, I found, in the same place, that most of the seeds had been blown away by the wind, but many of the plants still bore their fruit, so that I succeeded in obtaining several pounds without dismounting ; ripe as they were, and carefully as I guarded them, they would not germinate in Europe. On this day the temperature after sunrise was 15° , the maximum 29°C . Gum ammoniacum is in this district abundantly gathered, and sold in Ispahan. In the country it is much used as an inward medicament, and also frequently for greasing the spinning-wheels, as it is very cheap. The plant is, above all, an excellent food for sheep. At the Vienna Exhibition there was a lump of gum ammoniac, shown in Morocco, stated to be obtained in that country.

Galbanum resin (*Ferula galbanum*) is called Barzed and Baredsche in Persian, and Khasni in Turkish (though the name Khasni is also used in some Persian districts). This plant requires a greater elevation above the level of the sea than the ammoniacum. I found it at a height between 7,000 and 8,000 feet on the mountains adjoining the Valley of the Laar, where I collected a few ounces of the best galbanum. It is also frequently found on the mountains by the village of Dehgirdu, at an elevation of 6,000 feet. The leaves resemble the other ferulas in their structure. When I passed by the village on the 27th of June, 1859, the leaves had already fallen, but the flowers had not yet developed their light orange color. The plants were covered with tears of resin ; the root was of a roundish form and about the same size and shape as a large black radish, with two spreading shoots. The temperature on this day (27th of June) was, in Dehgirdu, before sunrise 7°C ., at mid-day 21°C . Water boiled at $92\frac{1}{2}^{\circ}\text{C}$. Galbanum is frequently used for plasters, and inwardly for menstrual illnesses, in the country ; it is also exported from the above district to Constantinople under the name of Khasni.

Ferula Asafætida, Lin.—In Persian the resin is called Anguze (from which the abbreviation asa. may have been derived). In Arabian

it is called Heltit mumtin. In former times it was very frequently found on the Trachyt mountains, between Ispahan and Mahiar, to which place the collectors came from Mischhed in Khorassan. At the commencement of spring they surrounded the stem with a wall of stones, placed a pot over it, and thus collected the resin. Gradually the collectors became fewer and fewer, as hardly any plants remained for propagation, and at last it was entirely deserted. It is, however, found in abundance between Abadeh and Murgab. Round about Abadeh, where in spring-time the sheep feed on the leaves, the milk and the butter are of such a disgusting odor, that only the natives can use them. It is also abundant from Dschendak in Khorassan to Herat. An Englishman brought me sprouts, which were covered all over with asafœtida tears. In the district of Herat the gum is collected in a regular manner: in spring the plants are dug round, about the 20th of May the stalk near the roots is cut through the middle, and after three days the resin is scraped off. Three days later a horizontal segment is again cut off, and then the resin is collected in three days. This process is repeated four times. It appears that this plant requires a warm climate and a low sea level.

The uses of the resin are manifold. The largest quantity is exported to India, where it is employed for culinary purposes; it is a frequent ingredient in the sauce for pillaus. The Turcomans are very fond of the young shoots dipped in vinegar. Its medical uses in Persia are very numerous. I know people there who are so accustomed to the anguze for nervous complaints, that it is, like opium to opium-eaters, one of the necessities of life. Its excellent antispasmodic qualities are too little known in Europe. I have also heard that in many districts the fields are surrounded with anguze, in order to protect the plants from the depredations of insects.

Ferula Sagapenum.—This gum is called Sagbinedsch in Persian, from which sagapenum is derived. I could only learn that this plant is common in the mountains of Luristan, and the gum is collected at that spot. The character of the resin, which resembles the *Asa dulcis*, as well as the seeds which are found in the resin, is characteristic of the family of *Ferula*.—*Four of Appl. Sci.*, Aug. 1, 1876.

SERUM- AND EGG-ALBUMIN AND THEIR COMPOUNDS.

BY A. HEYNSIUS.

After recapitulating the results of his former paper (Jour. Chem. Soc. [2], xiii, 469), the author brings forward objections to Schmidt's view, that albumin is a substance of itself soluble in water (see this Journal [2], xiv, 87—89). Schmidt obtained by dialysis a neutral liquid, which did not coagulate on heating, and contained no soluble ash-constituents. The author's objections to Schmidt's conclusion are :

1. A neutral reaction does not necessarily mean entire absence of alkali, inasmuch as alkali can combine with egg-white without causing the reaction to become alkaline. This is proved by experiment. After long-continued dialysing a liquid was obtained, which became turbid at lower temperatures than that obtained after a shorter process of dialysing ; because in the former case the alkali was more completely removed.

2. The failure of Schmidt to obtain any soluble salts from the liquid, which he regarded as a solution of pure albumin, is ascribed to the small quantity of material employed. It is shown by experiment that an amount of alkali, which is so small as to be unrecognized in the ash of such quantities of liquid as Schmidt employed, is sufficient to prevent coagulation of albumin (blood-serum and egg-white) on heating. A minute trace of acid also prevents coagulation.

$\frac{4}{10}$ ths cc. of $\frac{1}{1000}$ normal alkali ($=0.0000124$ grm.) caused dialysed blood-serum to remain clear on boiling. 2 cc. of the same solution ($=0.000062$ grm. alkali) prevented coagulation of dialysed egg-white. $\frac{7}{10}$ ths and $\frac{6}{10}$ ths of cc. of $\frac{1}{100}$ normal acid solution respectively prevented coagulation in blood-serum and in egg-white.

It is further urged that the small quantity of alkali present in dialysed albumin will most probably be found in the insoluble ash, inasmuch as it is known that alkali—especially soda—when heated with phosphates of the earths, gives insoluble double salts.

The author concludes that, after the most careful dialysing, there is obtained :—1. A compound of albumin with calcium (and magnesium) phosphate, which is soluble in water, and from which albumin is precipitated on boiling. 2. That albumin free from salts cannot be obtained by dialysis, and that we are not therefore justified in saying that albumin is of itself soluble in water. 3. That with this compound there is associated (in the case of blood-serum, at

least) a small quantity of albumin combined with soda, which alkali prevents to a greater or less extent, according to the quantity in which it is present, the coagulation alike of the albumin combined with itself, and of that combined with calcium phosphate, when the liquid is heated.

The compound of albumin with calcium (and magnesium) phosphate is possessed of the following properties :

1. It is decomposed by acids and by alkalis, the albumin remaining in solution ; the more concentrated the solution, the total quantity of albumin remaining unchanged, the greater is the quantity of alkali or of acid needed for decomposition.
2. It has an extremely faint acid reaction, becoming visible only after many hours.
3. Probably different compounds are formed, according as serum or egg-albumin is employed.
4. The compound is decomposed by warming ; the longer dialysing has been continued, the lower is the temperature of decomposition ; 50° was the lowest point noticed when distilled water was used in dialysing.
5. The decomposition temperature is raised not only by the addition of acid or alkali, but also by neutral salts.

There is no difference between the albumin obtained from this compound by the action of alkalis, and that found combined with alkalis in genuine egg-white.

The third part of this paper discusses the influence of alkalis and of acids upon albumins. It is shown that the quantity of acid or of alkali required to keep albumin in solution, on boiling, is influenced by the presence of neutral salts (NaCl was chiefly examined) ; that with a small quantity of sodium chloride the solvent influence of acids is marked, but with a large quantity of sodium chloride alkalis exercise a more distinctly solvent action. The albumin remains in these cases in the uncoagulated form. The stronger acids, as nitric, exercise a more marked solvent action than the weaker, as acetic, in the presence of an unvarying quantity of sodium chloride. Tables are given, containing the results of experiments with different acids and varying quantities of salts, especially sodium and calcium chlorides, upon albumin.—*Four. Chem. Soc.*, August, from *Pflüger's Arch. f. Physiol.* xii, 549-596.

VARIETIES.

FRENCH PHARMACEUTICAL STATISTICS.—According to the recent statistics, quoted in the last issue of the *Bulletin Commercial*, there are at the present time in France 2,121 pharmaciens of the first class and 4,089 of the second class being a total of 6,210 pharmaciens. Ten years since, in 1866, there were 2,457 of the first class, and 3,346 of the second, or altogether 5,803 pharmaciens. Next to the department of the Seine, in which alone there are 820 pharmaciens (495 first class and 325 second), the departments having the highest number of pharmacists are the Bouches-du-Rhone, Gironde, Nord, Seine-Inferieure, Seine-et Oise, Var, and Haute-Garonne. Between the 1st of January, 1803, and the 1st of January, 1876, the superior schools, the medical juries, and the preparatory schools of pharmacy have conferred no less than 16,650 degrees of pharmacien of which 6,462 have been of the first class and 10,188 of the second. On the average there is now in France one pharmacy to 10,000 inhabitants and a territorial area of 2,000 hectares.—*Phar. Jour. and Trans.*

THE NUMBER OF PHARMACIES IN ST. PETERSBURG is leagally regulated, so that for every 12,000 inhabitants one apothecary store may be established, and each store should on an average of three succeeding years, put up 30,000 prescriptions. According to statistical computations of the Russian department of the Interior, the inhabitants of St. Petersburg are only 3,471 in excess over the number fixed for the apothecary stores, and the prescriptions compounded by the latter, during the three years, 1873 to 1875 inclusive, averaged only 29,785; the establishment of new stores will for these reasons, at present, not be permitted.—*Apoth. Zeit.*, No. 21.

MEDICAL STATISTICS OF WURTEMBERG.—In 1866 the number of physicians was 447, residing in 191 communities, or one for every 3,970 inhabitants; towns and cities of over 5,000 inhabitants had one physician for 1,334, and the country one for 5,898 of the population. In 1876 the number of physicians had increased to 500, who resided in 194 localities; 1,464 of the population of towns and cities, and 5,971 of the country population, have now one physician.—*Phar. Zeitung*.

M. J. SCHLEIDEN, the well-known botanist and pharmacologist, celebrated the fiftieth anniversary of his doctorate, August 20th.

SULPHIDE OF CARBON AS AN INSECTICIDE.—The use of carbon sulphide is, recommended by J. B. Schnetzler, of the Lausanne Academy, as a means of destroying the insects which infest herbaria and entomological collections. The Academy collection of Swiss flowering plants having been attacked by *Anobium paniceum*, M. Schnetzler had a wooden box made large enough to contain five fasciculi of the herbarium, each composed of about 200 plants. Four ounces of carbon sulphide were poured into the five fasciculi; the box was tightly closed, and the whole left for a month. All the insects were destroyed, and no injury was done to the specimens, or to the papers to which they were fastened. The expense of the operation

is very small. M. Schnetzler recommends that the boxes should be placed under a shed, as in case of the escape of vapor there might be danger of explosion. The same process may be employed for collections of insects.—*Pop. Sci. Mo.*, Oct., 1876.

OINTMENT FOR BURNS.—Dr. Bedford Brown, in an article on burns, recommends the following treatment to allay pain and promote the process of healing :

Take iodoform,	2 dr.
Spermaceti ointment,	1 oz.
Extract of conium,	1½ dr.
Carbolic acid,	10 drops.

This, spread on fine linen, is applied twice daily to the inflamed surface, and then enveloped in oiled silk, no other dressing being required. In cases where there is great dryness of surface from destruction of vitality and want of exhalation, the wound, before applying the ointment, should be coated with the common linimentum calcis, which affords a soft and moist dressing, and in no wise interferes with the action of the iodoform. The iodoform acts as a certain and most effective sedative on the painful and exposed surface, and at the same time as an antiseptic. It reduces inflammation and suppuration, when in excess, in a remarkable manner, promptly converting a most painful and irritable wound into one that is comparatively painless. It is also an excellent promoter of healthy action and the healing process, and has besides the great advantage of rendering the use of anodynes unnecessary.—*Philadelphia Medical Times*.

TEST FOR BILIOUS URINE.—O. Rosenbach recommends in "*Med. Centr. Bl.*," the following as the easiest and a very reliable test for bile in urine :

Urine is filtered through white filtering paper ; if it contains bile the paper will be colored lively yellow till nearly brown. Now let one drop of pure concentrated nitric acid run down the side of the still moist filter ; it will, in the presence of bile, leave a yellow streak, which soon turns orange with a violet border, and outside of this dark-blue and emerald-green. These colors stay sometimes for hours.

Urine, otherwise dark-colored, but not containing bile, does not show this display of colors.—*Ny Phar. Tid.*, 1876, p. 195.

H. M. W.

ARTIFICIAL COLORING OF WINES.—Since the vintage of 1875, the artificial coloring of wines in France has attained such a development as to raise fears not only for the good name of French wines, but also for the public health. The Syndicate of wine merchants of Paris has taken the matter up and urged it upon the attention of the French Government in a vigorously written memorial, in which it is roundly asserted that the sole object of the coloring is so to treat a wine, at an insignificant cost, that it may be sold considerably above its real value. Formerly coloring was only done to a small extent and with vegetable and comparatively inoffensive matters, but now it is stated, hundreds of kilograms of arsenical fuchsin and other equally poisonous substances are used for the purpose and the sale of such preparations is openly advertised. The Syndicate urges that it is useless to discuss in chemical laboratories whether fuchsin itself, or arsenical fuchsin when diluted to

a certain extent, is poisonous or not, there being no guarantee against the greediness of the wine colorer. One result of the agitation has been that the officers of *octroi* have been ordered to take samples, for analysis, of all red wines coming into Paris.—*Phar. Jour. and Trans.*, Sept. 23.

PRESERVATION OF SYRUPS BY SALICYLIC ACID.—Mr. Lajoux, a Paris pharmacien, has been making some experiments with the object of ascertaining the minimum quantity of salicylic acid by which the fermentation of syrups can be prevented during the summer. The syrups experimented upon were red-currant, cherry, mulberry, capillaire, gentian and compound ipecacuanha. It was found necessary to add a quantity of salicylic acid equal to one thousandth part of the weight of the sugar in the syrup. Syrups thus prepared were kept simply covered with a sheet of paper at a mean temperature of about 17°C. At the end of two months they were intact, whilst the same syrups, placed in the same conditions, but without salicylic acid, were completely altered.—*Phar. Jour. and Trans.*, Sept. 16.

TEST FOR SUGAR.—Vidau has observed that a mixture of equal parts of hydrochloric acid and oil of benne (*Ol. Sesami*), either in the cold, or when slightly heated, assumes a distinct rose-color in the presence of cane or grape sugar, provided not less than 0.001 gm. ($\frac{1}{100}$ gr.) of sugar is present for every c.c. (16.3 min.) of mixture.—*Journ. de Pb. et d. Chim.*

CHROMIC INKS.—As long ago as 1848, Professor F. Runge invented what he called a chromic ink, from its containing chromate of potash. His directions for its preparations, published at the time in Dinger's *Journal*, were as follows: A decoction of logwood is first made in the proportion of 10 to 80, that is 10 lbs. of logwood is boiled with enough water to produce 80 lbs. of the decoction. To 1,000 parts of this logwood extract, when cold, is added 1 part of yellow chromate of potash, stirring rapidly. It is ready for use at once. Gum and other additions are injurious, he says, to this ink.

The following year W. Stein proposed an improvement on Runge's ink, saying that the great fault of this ink was that it soon became thick, like sour milk. This he overcame by adding four grains of corrosive sublimate to each bottle. This would restore thick ink to its pristine quality, and improve its color changing it from deep indigo blue to pure black.

In 1867, C. Puschner described a new ink similar to the above, made as follows: Boil 10 ozs. of logwood in 20 ozs. of water, then boil again in 20 ozs. more of water, and mix the two decoctions; add 2 ozs. of chrome alum and boil another quarter of an hour. One oz. of gum arabic is added, and we have 25 oz. of deep black ink.

Böttger says that a simple method of preventing gelatinizing in chromic ink is to add to the water in which the extract is made some carbonate of soda. His method of operation is as follows: Dissolve 15 parts of extract of logwood in 1,000 parts of distilled water to which 4 parts of carbonate of soda has been added at boiling heat, and add 1 part of yellow chromate of potash, dissolve in a little water.—*Scientific American*, Nov. 4th.

SOAP-ROOT.—A large commerce is carried on from California in a fibrous substance known as soap-root. It is obtained from a lily-like plant, a species of *Phalangium* (*Chlorogalum pomeridianum*, Kunth,) which is met with about the mountains, and attains a height of eight feet. The heavy bulb is covered with many coatings, consisting of fibres, which are used for cushions, mattresses, etc. Large contracts are entered into for the supply of this material on a very extensive scale. The inner part of the bulb serves as a substitute for soap, and it might be tried whether it can be utilized for technological purposes like the root of *saponaria*—*Drug. Cir. and Chem. Gaz.*

A PANIC AMONG SPONGE DIVERS.—Advices from Beyrout state that the last crop of Turkey sponge was very deficient, and prices of ordinary and common sponges have greatly risen in consequence. The deficiency is attributed to a panic among the divers, caused by the appearance in the neighborhood of Batroun, Mount Lebanon—the chief sponge fishing locality—of a sea monster, alleged to have been equal in size to a small boat. Its actual depredations among the divers appear at the present time to have been limited to one man, whom he is said to have swallowed whole.—*Drug. Cir. and Chem. Gaz.*

MINUTES OF THE PHARMACEUTICAL MEETING.

The first meeting of the session was held October 17th, 1876, Prof. Remington in the chair. An election for Registrar was held, resulting in the re-election of William McIntyre. The minutes of the last meeting were read and approved. The chairman introduced the strangers and students present, and urged all to continue their attendance. The following presentations were made: From the Chinese Commission to the Centennial Exposition, the Catalogue of the Chinese Imperial Maritime Customs Collection at the United States International Exhibition, Philadelphia, 1876. From Henry S. Wellcome, a handsome framed drawing of *Eriodyc-tion Californicum*, the "Yerba santa" or "mountain balm" of California, which is recommended as an efficient remedy for lung diseases.

A. P. Brown read a paper describing a new method of preparing Syrup of Li-quorice Root and Brown Mixture (See page 487.) He had also made and used Am-moniacal Glycyrrhizin to mask the bitter taste of quinia; two drachms of the glycyrrhizin are dissolved in one pint of sprup, then to each fluidrachm is added one grain of quinia sulphate. In making ammoniacal glycyrrhizin care must be observed to use chemically pure sulphuric acid in the precipitation, and in the preparation of the compound mixture of liquorice, by the process suggested, an excess of ammonia must be avoided.

In answer to an inquiry as to what is sweet syrup of quinia as used in Baltimore, the chairman suggested that it might be a mixture of syrup and tannate of quinia, the objections to which he stated, or one of undissolved sulphate of quinia in very thick syrup.

P. P. Fox exhibited a sample of ground flaxseed made in a Swift's drug mill. It had occurred to him that a rough way of estimating any admixture of cake meal was by measurement—the ground flaxseed being lighter than the cakemeal, one quart of the former, loosely measured, was found to weigh $12\frac{1}{2}$ to 14 ounces, and of the latter 16 ounces avoirdupois. Prof. Remington said a more accurate way would be the determination of the amount of oil in the sample.

C. J. Biddle stated that the Philadelphia Hospital cakemeal is always used with the addition of olive oil in making the cataplasms.

Boldo bark and leaves were exhibited by C. J. Biddle, who read a number of articles from various journals, descriptive of the drug and its tonic properties, with a decided action upon the liver; in this country it was stated to have been experimented with by Dr. Zaremba, of Chicago.

On motion, adjourned, to meet on November 21st, 1876.

WILLIAM MCINTYRE, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.—A stated monthly meeting was held at the College Hall, October 5th, 1876. President Kennedy stated that the object of the meetings of which this was the first, was to elicit by informal discussion the various practical hints derived from the experience of each one, which, as a whole, contribute so materially to the knowledge of the competent pharmacist.

A paper was read from Mr. Wm. McIntyre, on the solubility of quinia in mixtures of ammonia and alcohol, and formulæ given from several authorities. (See p. 488.) Salicylic acid claimed some attention. Salicylated cotton wadding, the process for which was given by Mr. Mitchell, is a convenient mode of applying that agent; it contains two per cent. of the acid.

Mr. Kennedy spoke of a false fucus sold for the true gulf weed, *Sargassum bacciferum*. Changes in prescriptions, syrup of wild cherry and other subjects occupied the meeting until its adjournment.

WALLACE PROCTER, *Secretary.*

MARYLAND COLLEGE OF PHARMACY.—The building recently purchased was formally dedicated October 13th, Hon. L. H. Steiner, M. D., of Frederick, who was formerly Professor of Chemistry in the College, delivering the dedicatory address in his usually eloquent style. He reviewed the past history of the College; congratulated the members on their valuable possession, and prophesied a bright and useful future for the College. A goodly number of ladies were sprinkled through the audience and several distinguished persons occupied seats near the speaker. On the conclusion of Prof. Steiner's address, Mayor Latrobe spoke in the highest commendation of the institution and expressed satisfaction in having aided the Trustees in the consummation of the purchase, and expressed the belief that the present school was even of more public benefit than the one which recently occupied the building. After benediction was pronounced by Dr. Dalrymple, the company repaired to

Guy's Hotel, where a sumptuous feast had been prepared, which was highly enjoyed by those present.

The building, though the oldest public school edifice of Baltimore, is still in excellent condition, having been erected in the most substantial manner. It is commodious, well ventilated and pleasantly located, and in every way well suited for the uses of the College. The lot is 74 ft. x 100 ft., the building 45 ft. x 75 ft. It was erected in 1830 for Male Grammar School No. 3, and was latterly occupied by Female Grammar School, No. 3. It was purchased at the very reasonable sum of \$2,000, with an annual ground rent of \$109, in consideration of the uses to which it was to be applied, and in order to secure this advantage Messrs. Sharp & Dohme volunteered to advance the necessary sum as a loan to the College; but before the time to make the payment the entire amount had been secured by subscription, and enough more to put the building in good repair. Thus the College has entered on a new era, out of debt, and in a building well adapted for lecture and other necessary purposes.

We congratulate our Maryland friends at their success, and hope that the other pharmaceutical colleges which are still without a habitation of their own may soon be equally successful in securing a permanent home.

THE NETHERLAND PHARMACEUTICAL SOCIETY held its twenty-eighth annual meeting at Amsterdam, June 22d. It consists at present of 190 members, with Mr. A. J. Rijk, of Amsterdam, President. A resolution was passed declaring that the advertising of remedies for diseases was in conflict with the true and dignified practice of pharmacy. A plan submitted by Mr. Opcoijrda, endeavoring a greater uniformity in the charges for prescriptions, was adopted.

THE GERMAN APOTHECARIES' SOCIETY held its fifth annual meeting at Stuttgart, Sept. 6th and 7th, Director Wolfrum, of Augsburg, presiding. The report of the Directory gives an account of its activity during the past year; it advocates a representation of the Society in the administrative departments of the State and each district, and gives a copy of the draft of a law concerning the establishment and moving of pharmacies, which had been submitted to the various governments; also, a memorial to the governments in relation to the proposed trade law. The Society has now 2,750 members. The vacancies in the Directory occasioned by the resignation of Messrs. Schacht and Hartmann were filled by the election of Messrs. Brauweiler and Wimmel. A resolution was passed recommending a permanent commission on the "Pharmacopœia."

In accordance with the proposition of Dr. Leube, the Society voted for each district (19 in number) a contribution of 10 marks to the Hanbury memorial in London. Resolutions were passed admitting the pharmacists of Alsace and Lorraine on favorable terms; appropriating money, if necessary, to promote the exhibitions in connection with the annual meetings; charging the Directory with the preparation of a memorial concerning the traffic with secret medicines, and with its presentation to the proper authority; recommending the separation, at the various universities, of the professorship of pharmacy from that of general chemistry, and the cre-

ation of a chair of practical chemistry, which should be filled by a practical pharmacist; also, one declaring in favor of saleable concessions for pharmacies, and of their limitation according to the actual need.

Two scientific lectures were delivered by Prof. Fraas on the geology of Wurttemberg, and by Prof. Reichardt on the examination of atmospheric air for ozone and hydrocarbon.

The next meeting will be held at Leipzig.

FRENCH PHARMACEUTICAL SOCIETY.—At the Congress of the Local Pharmaceutical Societies of France, held at Clermont, August 17th to 19th, the formation of a general pharmaceutical society was resolved upon, and a resolution passed recommending the extension of the apprenticeship to four years, and the compulsory examination of assistants.

PHARMACEUTICAL SOCIETY OF NEW SOUTH WALES.—We learn from the "Pharm. Journal" that such a society has been established for the purpose of uniting the chemists and druggists in that colony "in one ostensible, recognized and independent body for protecting their general interests, and for the advancement of pharmacy by furnishing such a uniform system of education as shall secure the profession and the public the safest and most efficient administration of medicines."

The new society has speedily obtained legislative recognition, and an act has been passed entrusting to a Board of Pharmacy, elected from the council of the society, power to control all matters relating to the conduct of pharmacy, sale of poisons, etc., throughout the colony.

EDITORIAL DEPARTMENT.

THE SANITARY CONDITION OF PHILADELPHIA DURING THE INTERNATIONAL EXHIBITION.—In the June number, p. 283, we published a circular from the *Bureau of Medical Service*, organized in connection with the Centennial Exposition, in which the average mortality, during the past four of five years, of six cities of over 500,000 inhabitants was given, showing that the average death rate was lowest in Philadelphia. This condition has not been materially altered during the past summer months, notwithstanding the protracted heat during a part of that time, and although the influx from strangers was quite considerable; the following circular, issued by the same bureau, will give further account:

Bureau of Medical Service.—In a former circular issued from this Department, the exceptionally favorable position which is occupied by Philadelphia, in comparison with the other great cities of the world (*i. e.*, cities containing over 500,000 inhabitants), in regard to its sanitary advantages and average rate of mortality, was shown by carefully prepared statistics. In anticipation of the unusually large number of visitors who would undoubtedly be present in the city during the continuance of the International Exhibition, great efforts were made by the municipal authorities as well as by those in charge of the Exhibition Grounds, to obviate every cause of disease. The details of these arrangements will be published in the official reports of the various departments, which will appear after the close of the Exhibition.

It is owing to their thoroughness that, despite the very severe and prolonged heat of June and July, and the vast number of unacclimated strangers constantly present in Philadelphia since the 10th of May, the general health of the city has been remarkably favorable. With the exception of the four weeks ending July 22, the range of temperature for the past five months has been about the average. Thus, for the entire period of 20 weeks since May 10, the mean daily temperature has been 71° 30' F., while the average for the same months during the past ten years has been 71° 82' F. The mean temperature of the four weeks referred to (ending July 22), on the other hand, was 80°, 83°, 83° and 81° respectively, giving an average for the month of 81° 75' against 75° 50' F., the mean temperature of the corresponding period of the previous year.

The following table, showing the relative mortality of Philadelphia and some of the larger American and European cities, has been prepared with strict care from the official records. The periods selected for comparison correspond as closely as possible. It will be seen, on careful examination, that the past season has not been an unfavorable one.

CITIES.	Estimated Population.	Number of weeks included and date in 1876.	Average mortality per week from Typhoid Fever and Diarrhoeal Affections.	Average mortality per week from Zymotic Diseases.	Average mortality per week from all causes.	Annual death rate per 1,000 during Typhoid Fever and Diarrhoeal Affection.	Annual death rate per 1,000 during Zymotic Diseases.	Annual death rate per 1,000 during all causes.
London.....	3 254,260	1875. 26 weeks, including the quarter ending June 19th and that ending Sept. 26th.	105.5	201	1467.4	1.66	4.62	23.40
Philadelphia.....	900,000	20 weeks, from week ending May 13th to week ending Sept. 23d, 1876.	83.8	112	406.5	4.84	6.47	23.48
Chicago	420,000	17 weeks, from week ending May 13th to the week ending Sept. 9th.	52	80	196	6.44	9.9	24.27
Boston.....	342,000	18 weeks, from week ending May 13th to the week ending Sept. 9th, 1876.	36.7	57.4	161	5.56	8.73	24.48
Baltimore.....	360,000	19 weeks, from week ending May 13th to the week ending Sept. 16th, 1876.	48.9	58.1	172.36	6.91	8.37	24.80
Paris	1,851,792	26 weeks, including the quarter ending June 25th and Sept. 24th, 1875.	64	115	896	1.76		25.16
Brooklyn.....	566,233	17 weeks, from week ending May 13th to the week ending Sept. 23d, 1876.	75.7		262	7.74	11.81	26.91
New York.....	1,064,236	18 weeks, from week ending May 13th to the week ending Sept. 16th, 1876.	174.9	262	629.7	8.52	12.79	30.73
Berlin.....	950,000	26 weeks, including the quarter ending June 30th and Sept. 30th, 1873.	901		626	10.92		34.32

It will be further observed that, as in the table published in the former circular, Philadelphia occupies an exceptionally favorable position. With the exception of London, whose rate of mortality is nearly identical, Philadelphia presents a considerably lower rate than any other of the great cities, while, in comparison with its nearest neighbors, New York and Brooklyn, its superiority is both striking and suggestive.

In calculating the rate of mortality in Philadelphia during the past twenty weeks, the population has been estimated at 900,000. Those who have carefully studied the movement of its population, expect, however, that, in consequence of the large influx of visitors, this estimate is below rather than above the mean daily population. It must further be borne in mind that, while a considerable portion of its more favored classes were, as usual, absent from Philadelphia during the summer months, the lower classes, among whom the mortality is always greater at this season of year, were largely reinforced. If, in addition to this, it be considered that a comparatively large amount of sickness might have been expected among the vast throngs of unacclimated visitors reaching the city after long and hurried journeys, and exposed to excitement and excessive fatigue, the full significance of the remarkable table above given will, it is hoped, be appreciated by all. As one of the most important factors in the maintenance of public health, is the purity of the water supply, it is with great satisfaction that we learn from the official report furnished by Dr. Charles M. Cresson, the distinguished analytical chemist, that the purity of the water supplied from the Schuylkill River to the Exposition Grounds and the neighborhood is fully up to the standard of the past four years.

As the summer months, during which time alone any fears could be entertained for the development of wide-spread disease, have passed with such gratifying results, it is not premature to express the feeling of thankfulness and congratulation that during this important year Philadelphia has been favored with the same exceptionally low rate of mortality she has so long enjoyed.

WILLIAM PEPPER, Medical Director.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Chemistry: General, Medical and Pharmaceutical, including the Chemistry of the "U. S. Pharmacopœia." A manual on the general principles of the science and their applications in medicine and pharmacy. By John Attfield, Ph.D., F.C.S., etc. Seventh edition. Philadelphia: Henry C. Lea, 1876. 12mo, pp. 668.

Since 1871, when the first American edition of this work was published, two more editions have been issued in this country, the volume before us being the third, leaving four editions which appeared in England between the years 1867 and 1875. The favor with which this work has been received in both countries is alone proof of its great utility; and, after having used it as a text-book in the laboratory of the Philadelphia College of Pharmacy during the last five years, we can speak from our own experience and testify to its intrinsic value in the practical instruction of the student. The more we have used it, the more we were pleased with it, and on the appearance of a new revised and enlarged edition, we take occasion to again cordially recommend it, believing that for the practical instruction of pharmaceutical students in chemistry it has no superior in the English language.

This seventh edition is considerably enlarged and improved, and is embellished with eighty-seven illustrations, each one being of practical utility in aiding the student in the performance of investigations. On page 386 we notice an omission to notice an improvement introduced in the last "U. S. Pharmacopœia." It is stated there, that in the process for preparing resina podophylli no acid was ordered. This was correct for the former "Pharmacopœia," but not for the present one.

Chemia Coartata, or the key to modern chemistry. By A. W. Kollmyer, A.M., M.D., Professor of Materia Medica and Therapeutics at the University of Bishop's College; Professor of Materia Medica and Pharmacy at the Montreal College of Pharmacy, and late Professor of Chemistry, etc. Philadelphia: Lindsay & Blakiston. pp. 111. Price, cloth, \$2.25.

The author intends this work as a useful aid to those who, from business occupation or from any other circumstance, may not have sufficient time at their disposal to consult more voluminous works, and it has therefore been his main object to compress into as small a space as possible everything connected with chemistry that deserves attention, and to give no more explanatory matter than is actually required. This aim has been well carried out, the text leaving nothing to desire in regard to briefness and, at the same time, sufficient clearness, to enable the advanced student to comprehend the intention of the author. The information given

is on the whole correct, but it may well be questioned whether for the production of some of the rarer metals other more productive processes should not have been indicated; whether for the preparation of carbonic acid gas, instead of chalk and sulphuric acid, the (in the laboratory) more convenient source from marble and hydrochloric acid should not have been mentioned, and whether, in view of the immense production of bromine from the mother-liquors of the salt brines, that source should not have been given in addition to sea water.

Inorganic chemistry occupies the first 72 pages; the following 30 pages are devoted to organic chemistry, and this is followed by a synopsis of poisons, their antidotes and general treatment. The tabular arrangement has been adopted wherever practicable, and a ready and convenient way is thus afforded for comparison.

The work is very well adapted for the purposes for which it has been prepared, and it will be found very useful by those who have learned the old notation and wish to become acquainted not only with the new notation, but also with the principles and theories which have led to the very general adoption of what is called the modern system of chemistry. We would not recommend it to students for general use, but we commend it to their careful examination with the view of learning therefrom how comprehensible and, at the same time, concise notes and excerpts from larger works may be made, so as to profit as much as possible from a close application to study.

Micro-photographs in Histology, Normal and Pathological. By Carl Seiler, M.D., in conjunction with J. Gibbons Hunt, M.D. and Joseph G. Richardson, M.D. Philadelphia: J. H. Coates & Co. Price, 60 cts. per number, \$6.00 per annum.

Parts IV and V contain hepatic cells from liver of a fly, leukaemia of the liver, blood corpuscles of man and of the ox, fat cells from mesentery of a cat, kidney of a mouse, chronic nephritis, Malpighian tufts and crystals of urea. The plates are well executed, and each one is accompanied by descriptive text.

Du M'Boundou ou Poison d'épreuve du Gabon. Par Léon KAUFFEISEN. Montpellier, 1876. 4to, pp. 55.

On the M'Boundou, or the ordeal poison of Gabon.

A very creditable thesis, presented and publicly sustained before the Ecole supérieure de Montpellier, August 14, 1876, for obtaining the degree of Pharmacist of the first class.

The *m'boundou*, also known as *casa*, *icaja* or *boundou*, is a shrub indigenous to equatorial Africa, and has been variously referred to the family of Apocynaceæ and Loganiaceæ, the latter view being taken by Duchailu, Griffon du Bellay and John Torrey, of New York, and seems to be the correct one as far as can be judged from the results of the author's chemical investigation, which resulted in the isolation of strychnia, while brucia appears to be absent.

In the first chapter of his essay, the author gives some notes of the uses to which the article is put in its native country, and states that large doses of palm-oil are there known to act as an antidote, or rather, as a preservative against its toxic effects. Descriptions of the roots and leaves are likewise given.

Chapter II refers to the physiological experiments made with boundou in France, and gives the yield of 13 extracts made with different menstrua from the wood, bark and leaves. The experiments made with these preparations upon rabbits and frogs, detailed in the third chapter, proved that 0.025 gram of the extracts resulted in the death of the frog after five minutes with the aqueous, and in ten minutes with the ethereal extract of the bark. The remaining extracts were somewhat weaker, and the ethereal and alcoholic extracts of the wood produced the same effect only after 6 hours and 23 minutes and 7 hours and 45 minutes respectively.

The last chapter treats of the chemical examination, the principal result of which has been mentioned above.

Specimen Fasciculus of a Catalogue of the National Medical Library, under the direction of the Surgeon-General U. S. A. at Washington, D. C. Government Printing-office, 1876. 4to, pp. 72.

The praiseworthy efforts which have been made to establish as complete as possible a National Medical Library has been so far successful, that at the beginning of the present year it contained about 40,000 volumes and about the same number of single pamphlets. It is the Medical Section of the Library of Congress, and now under the direction of the Surgeon-General U. S. A., in connection with the Army or National Medical Museum. To make such a library really as useful as it should be, a good catalogue is absolutely necessary, and the specimen fasciculus now before us proves that its preparation has been entrusted to competent hands. It is to be hoped that Congress will appropriate a sufficient sum of money to have the whole catalogue printed, which will doubtless be very voluminous, its comprehensiveness being such that page 72 closes with the subject *Air (atmospheric)*.

The Library includes, also, works on pharmacy, and there are at present missing in it only the January and July numbers of the "American Journal of Pharmacy," for 1857, to make that serial complete. If any of our readers should be able to supply them, the Librarian, Surgeon John S. Billings, U. S. A., will either pay a fair price for them or furnish in exchange from the valuable publications of the Surgeon-General's Office.

Nüchterne Betrachtungen über die in Frage stehende Reform des Pharmaceutischen Lehrplanes in Oesterreich. Von P. R. Stolzissi, Apotheker in Waizenkirchen. Wels: Joh. Haas, 1876. 8vo, pp. 37.

Sober considerations on the projected reform of the pharmaceutical education in Austria.

This pamphlet is more than of local interest, since it discusses a question which has on several occasions also come up in this country, namely, the relation and sequence of the practical instruction in the store and the theoretical instruction at a college or university.

A plan had been proposed for Austria, according to which the apprenticeship of the pharmacist was to be reduced to two years, to be followed by one year's instruction at a special school, and subsequently by a prolonged attendance at a university. As might have been expected, such a plan aroused the opposition of those pharmacists who do not take lightly the duty of training the young apprentices entrusted to their care, and who naturally expect a fair and equitable recompense for their care and trouble. But the question is of far deeper importance, involving the possibility of *becoming* a good and reliable pharmacist in the short space of two years, even though the standard of preliminary education be as high as it is demanded in many European countries, and likewise the possibility of *remaining* a reliable pharmacist after having discarded the practical business duties for several years' theoretical study at the university. Mr. Reithammer addressed letters of inquiry to a number of the most prominent apothecaries and pharmaceutical teachers. Schroff had proposed a greater extent of store practice, and his views like those advocated by Reithammer and the author are, in the main points, coincident with those expressed in the answers of such well-known men as Danckwortt, Dragendorff, Duflos, Flückiger and many others. The pamphlet contains in full the answers received from Wittstein, Hager, Landerer, Hirzel, Ladé and of one teacher at a pharmaceutical institute of a university, whose name is withheld, but can, we think, be readily guessed by those who are acquainted with his valuable contributions to science. With singular unanimity they advocate an apprenticeship of not less than three years, and afterwards a service as assistant of from one to three years previous to the academical course. The duration of the latter should, in the opinion of the majority of those named above, not be *fixed* at more than three semestres preceding the admission to the examination; indeed, Hager lays particular stress upon a *long*

service in the business, and points out the fact that many of the best and learned (German) pharmacists had attended but two semestres' university instruction after their apprenticeship, and a service as assistants in different places of from 5 to 10 years; and he closes his letter with the following proposition, which is well worthy of consideration: *Experientia est optima rerum magistra!*

Medicinal Plants, being descriptions with original figures of the principal plants employed in medicine, and an account of their properties and uses. By Robert Bentley, F.L.S. and Henry Trimen, F.L.S. Philadelphia: Lindsay & Blakiston. Price, \$2.00 per part.

Parts IV and V of this instructive and useful work contain the handsomely-executed colored plates, together with the descriptive text of the following medicinal plants: *Brassica nigra* and *alba*, *Linum usitatissimum*, *Ruta graveolens*, *Citrus limonum*, *Paullinia sorbilis*, *Dorema Aucheri*, Boissier (a plant not previously figured, which affords very good ammoniacum), *Helleborus niger*, *Chondrodendron tomentosum*, *Hæmatoxylon campechianum*, *Brayera anthelmintica*, *Datura stramonium*, *Atropa belladonna* and *Ficus carica*.

The descriptions of the botanical characters, habitat, properties and uses are, as in the preceding numbers, full and accurate.

OBITUARY.

ALEXANDER KING and SAMUEL B. SPENCE, both promising young men and members of the graduating class of 1874 of the Philadelphia College of Pharmacy, died recently, the former at Canandaigua, N. Y., on September 10, the latter at Fond du Lac, Wis., on October 8, both being in their twenty-sixth year, and falling victims to that scourge, pulmonary phthisis.

Mr. King was born at Jersey City, and lost his father, Rev. David King of the Old Wall street church, New York, at the age of three years, and soon afterwards also his mother. He was reared by his father's parents, and educated at the Canandaigua Academy. At the age of fourteen he entered the store of his uncle, Wm. King, Jr., at Buffalo, and in 1872 came to Philadelphia to attend the College of Pharmacy. After graduation, he returned to his uncle, and remained with him until a few months ago, when his health began to fail rapidly, admonishing him to seek rest and change at his former home, where he succumbed.

Mr. Spence learned the drug business with Kalk & Kent, of his native city, and after spending two winters at Philadelphia, and graduating, returned to Fond du Lac, where soon after symptoms made their appearance inducing him to seek for a change of climate in California, hoping that the mountain air might stay the advances of the disease. Not attaining the desired relief, he returned home last summer to die among his kindred.

Both deceased were of retiring disposition, quiet and unobtrusive in their demeanor, and left records of uprightness behind them. Both wrote, on graduation, creditable theses, the one by Mr. King, announcing the discovery of morin and mori-tannic acid in *Maclura aurantiaca*, having been published in this journal in June, 1874.

JOHN B. CRESSON, aged 59 years, a member of the Philadelphia College of Pharmacy, died October 23d, 1876. His entire life was spent in this his native city. He was much respected for his moral worth and uniform gentlemanly bearing.

MARSHALL S. COWPERTHWAITHE died July 29 of pneumonia at Burlington, N. J., and was buried near Medford, his native place. He was apprenticed to John A. Vandegrift, Burlington, and last winter attended the lectures at the Philadelphia College of Pharmacy, giving promise of future usefulness.

THE AMERICAN JOURNAL OF PHARMACY.

DECEMBER, 1876.

SPECIFIC GRAVITY OF FLUID EXTRACTS.

BY G. H. CHAS. KLIE.

The "Pharmacopœia" gives formulæ for quite a number of fluid extracts, with mode of preparation circumstantially described, and apparently all proper precaution taken to insure efficient preparations. An experienced operator, if he uses good drugs, will no doubt generally make good fluid extracts. What the "Pharmacopœia" fails to give is a standard to measure the strength of the fluid extracts by. If such an one had been adopted, very likely, more uniformity in strength would result in this class of preparations.

Of the different methods to find the strength of fluid extracts, specific gravity, presumably, is as good as any. Its adoption as the standard would force the preparer, if he wanted to attain it, to use the prescribed menstrua. Another point in its favor is: it is easily ascertained and in a comparatively short time.

Precipitation is very accurate in estimating the strength of fluid extracts, but it consumes more time and does not indicate the menstrua.

To understand the specific gravity of the different extracts properly, that of the menstrua, with which they are severally prepared, must be taken into consideration, or rather, in what approximate proportion the menstruum exists in the extracts when done. The "Pharmacopœia" directs the use of six different primary menstrua, viz.: Alcohol alone, and alcohol, glycerin and water in 5 proportions, and several secondary menstrua of alcohol and water. Six primary menstrua are given in the list below, one of them being diluted alcohol, which alone is not directed in any of the fluid extracts. The specific gravity in the list of extracts marked "purchased" seems to indicate that one of them was made with alcohol and the others with dilute alcohol. One of

the menstrua of alcohol, glycerin and water is not represented in the list.

The strength of a fluid extract is indicated by the difference between its own specific gravity and that of the menstruum. What is required, therefore, is to know the specific gravity of the approximate menstrua, not as they are used for percolation, but as they are likely to exist in the extract when done.

I have ascertained the specific gravity of the fluid extracts which I have on hand. Below I give the list with the specific gravity of each annexed. 28 are officinal and 18 non-officinal, 39 are of own make and 7 purchased. Before each series of fluid extracts the approximate menstruum and its specific gravity has been placed. As a matter of course due regard has been paid, during process of weighing, to the temperature of the extracts and the state of the atmosphere, the thermometer showing 60° Fahrenheit and barometer 30 in.

<i>Alcohol</i>, . . . . .	.825	<i>Alcohol</i> , pts. 7 }	
Extract. buchu fluid. . . .	.895	<i>Glycerina</i> , " 4 }	1.004
" cisticifugæ fluid. . . .	.890	<i>Aqua</i> , " 5 }	
" damianæ fluid. purch'd,	.935	Extract. belladonnæ fol. fluid.	1.098
" cubebæ fluid. . . . .	.871	" caffèæ " "	1.124
" gelsemini fluid. . . . .	.904	" collinsoniæ " "	1.045
" serpentariæ fluid. . . .	.910	" cort. aurant. " "	1.101
" valerianæ fluid. . . . .	.975	" cinchonæ rubr. " "	1.092
		" alni rubr. " "	1.044
<i>Alcohol dilutum</i>, . . . . .	.942	" digitalis " "	1.075
Extract. lactucæ fluid. purch'd,	.992	" ergotæ " "	1.071
" pareiræ brav. fluid. " "	.975	" eucalypt. glob. " "	1.073
" sennæ comp. fluid. " "	1.025	" gossypii " "	1.023
" apocyn. cannab. fluid. .	.982	" gentianæ " "	1.085
" hyoscyami fluid. " "	1.025	" kalmiæ latif. " "	1.095
" grindel. robust. fluid. "	1.028	" koussou " "	1.091
		" lappæ " "	1.132
<i>Alcohol</i> , pts. 6 }		" liquiritiæ " "	1.101
<i>Glycerina</i> , " 1 }	.957	" pruni virg. " "	1.095
<i>Aqua</i> , " 1 }		" pteleæ " "	1.043
Extract. colombæ fluid. . .	1.012	" stillingiæ " "	1.055
" hydrast. can. fluid. . .	.971	" sambuci " "	1.102
" rhei fluid.	1.086	" sumbul " "	1.031
		" senegæ " "	1.091
		" taraxaci " "	1.121
		" uvæ ursi " "	1.131
		" scillæ comp. " "	1.163

<i>Glycerina</i> , pts. 4 }			Extract. sarsaparillæ fluid.	1'121
<i>Aqua</i> , parts 2 }	. .	1'056	" sennæ "	1'141
<i>Alcohol</i> , pts. 3 }			" sennæ et spigel. "	1'127
Extract. sarsapar. cp. fluid.		1'093	" spigeliæ "	1'118
<i>Alcohol</i> , pts. 5 }			<i>Glycerina</i> , pt. 1 }	
<i>Glycerina</i> , " 8 }	. .	1'087	<i>Aqua</i> , " 1 }	1'147
<i>Aqua</i> , " 3 }			Extract. ipecacuanhæ fluid.	1'207

Lowell, N. St. Louis, Nov. 5th, 1876.

PREPARATIONS OF MALT.

BY RICH. V. MATTISON, PH.G.

(Read at the Pharmaceutical Meeting November 21.)

For several years past there seems to have been an observed tendency among physicians toward the use of a class of preparations more or less representing the saccharine and albuminoid constituents of malted barley, and a number of medicinal preparations have been gradually introduced, some of which have found considerable favor among the profession as a slightly-*tonic* and valuable nutrient food, employed in dyspeptic and other stomachic disorders, caused by the non-assimilation of starch food.

Probably the most widely known in this country is the "Hoff's Malt Extract," which most of the members present may remember particularly, on account of the great difficulty experienced in being able to obtain it during the late Franco-German war, and the notoriety which one of our eminently-respectable houses at that time attained, through being able to supply, as genuine, a preparation put up in the ordinary London Stout bottles, with *fac simile* German labels. The genuine preparation does not seem to the writer to be properly called an extract of malt, since it certainly partakes more of the nature of a malt liquor, the principal difference being that it is of sweeter taste and less spirituous—more sugar and less alcohol than the ordinary malted liquors of commerce. The fact, however, of its containing a notable proportion of alcohol renders it, in the opinion of the writer, an objectionable article; not objectionable as a malt liquor, understand, but as an *extract of malt*, since a large portion of the sugar has been converted by fermentation into alcohol.

The nutrient properties of a good malt extract consist in the amount of malt sugar, diastase, etc., that is obtainable therefrom by the assimilation

lative organs of the human system, and to insure the proper amount of these principles depends upon the proper observance of four rules, viz. :

1st. The barley must be malted properly and carefully, to insure the formation of as large a quantity of diastase as possible, that by its action in mashing all the starch may be converted into sugar. The chemical change may be thus represented, the starch taking up the elements of water :



2d. The ground malt must be *mashed* carefully, with due regard to the temperature, so as to insure the largest amount of sugar being extracted with the smallest amount of water.

3d. The evaporation of the extract with a low degree of heat, to avoid charring any of the delicate constituents of the extract.

4th. The most scrupulous cleanliness must be observed at all times in and about all mash-tubs, kettles, capsules or other vessels used in its preparation.

A word as to the object of the preparation may not be out of place. It is well known that in the human economy the salivary glands and the pancreas secrete analogous principles, each having for its object the conversion of amylaceous principles into saccharine, that existing in the salivary secretion being known as ptyalin and that of the pancreatic juice as pancreatin. In the malted barley there is found a substance analogous to these, and having just as strong and subtle power of changing starch into sugar as the pepsin in the gastric secretion has the power of converting albuminous substances into peptone. This substance in malted barley is called diastase, and is formed during the process of germination or malting. A small portion of this substance has the power of converting an almost indefinite proportion of starch into sugar.

These facts being known, it is obvious that when the animal system is incapable, through deficiency of the natural secretions, of converting starch food into sugar, we must add some artificial saliva, as it were, to perform the work and make good the deficiency, and hence it is that the heavy feeling in the stomach observed after eating heartily of potatoes, corn-starch and other graminaceous or amylaceous food, is promptly removed by taking a small quantity of a good extract of malt.

Barley grown in high latitudes like Michigan, Canada and the like,

is generally the best, because of its containing more starch, which, in the process of mashing, is converted into sugar, and of course, there being more sugar, the yield of extract is larger, thus making the operation more successful, pecuniarily, to the manufacturer.

The process of malting we need not describe, being familiar to us all, and for the purposes of the malt-making pharmacist may be practically ignored, it being better to purchase the malted barley of a professional maltster.

The barley, then, being properly malted, is ground coarsely, and a tub, preferable of cedar, with a false bottom, perforated, and of a capacity of say 20 gallons (an old-fashioned upright churn answers very well), is filled with about 14 gallons of water, at a temperature of from 168° to 172° F. Into this tub about half a bushel of malt is added, little by little, until the whole is well stirred in. The tub is then well covered and set away in a warm room, and allowed to remain perfectly at rest for a period of three or four hours, taking care that the temperature does not fall below 150°F.

This is the process of *mashing*. At the expiration of the allotted time, the stop-cock below the perforated diaphragm is opened, and water of a temperature a little above the extract, which is now being drawn off below, and which we shall now call the *wort*, is sprinkled by means of a sieve or plant-sprinkler, upon the top of the malt until the wort being drawn off below is almost tasteless or of so low a specific gravity that it will not pay the cost of evaporation. In large operations this sprinkling is done by means of a patented revolving instrument called a "sparge," and which much resembles a lawn-sprinkler, that revolves by the pressure of the water being ejected from each side in opposite directions, the water being supplied from a large tank in which it is heated by steam, and the exact temperature being easily controlled by valves commanding abundant supplies of both cold water and steam. This wort that we have drawn off from our mash-tub or percolator, we now place in the capsule or copper kettle, and evaporate by means of a water-bath to the required consistence; the first run should have a high specific gravity, and contain about a pound of malt sugar to the gallon of wort. We present samples of this evaporated wort, which is now our malt extract.

A word now regarding cleanliness. The mash-tub and all other wooden or metal utensils should be washed out at least once a week

with dilute solution of caustic potash or soda, and any barrels, tubs, etc., should be kept filled with lime water when not in use, as the tendency of the wort which may be left in them is very great toward fermentation, and a few grains of malt accidentally left in the tub, and which have undergone putrefactive change, may completely spoil the subsequent batch of malt at the next mashing.

Extract of malt with iron is easily prepared by the addition of a syrupy solution of ferric pyrophosphate, in the proportion of four grains to the tablespoonful.

Extract of malt with pepsin has been proposed as a valuable preparation in dyspeptic troubles, since it would certainly have valuable digestive properties, acting upon both amylaceous and albuminous substances.

Extract of malt with cod liver oil is proposed as the acme of all emulsions of cod liver oil. When we reflect on the fact of cod liver oil being simply food and not medicine, and then combine this with a preparation having of itself the property of transforming non-assimilable food into that which may be easily assimilated, beside being a valuable nutrient, we have as an emulsion (and it makes a perfect emulsion without the use of any gum, sugar or other vehicle) a preparation of double the nutrient value of the ordinary emulsions of cod liver oil. A preparation, also, that is very pleasant to the palate as well as the stomach, a fact that, in these days of elegant pharmacy need not be overlooked.

Samples of this preparation, consisting of 50 per cent. each of cod liver oil and extract of malt, are here presented. It is easily prepared, is both pleasant and permanent, and may be mixed with water without separating the oil.

CONTRIBUTIONS FROM THE SCHOOL OF PHARMACY OF THE UNIVERSITY OF MICHIGAN.

Communicated by PROF. ALBERT B. PRESCOTT.

IX. *Precipitations by the Phosphoric Acids.* By JAMES W. MORGAN, Ph.C.

This investigation was to ascertain what normal metallic salts, in solution, will form precipitates by addition of solutions, respectively, of free orthophosphoric, pyrophosphoric and metaphosphoric acids. Farther, in cases of such formation of precipitates, what quantities of certain acids are needed to dissolve them; and, in cases of non-forma-

tion of precipitates, what proportion of the phosphoric acids must be neutralized by alkalies in order to cause the precipitates ?

All the metallic salts and all the acids were obtained and used in solutions of known strength.

The orthophosphoric acid was prepared by the first process of the U. S. "Pharmacopœia" for the diluted acid, and was used of the strength of that preparation, near 10 per cent. of acid.¹

For the pyrophosphoric acid, ordinary sodium phosphate was fused to pyrophosphate ; the solution of the latter precipitated by lead acetate solution, and the washed precipitate transposed with hydrogen sulphide. The filtrate was freed from gas by evaporation in vacuo at ordinary temperature. The solution was found free from sodium salt and from extraneous acids. One cc. contained 0.0608 gram of the acid.

The metaphosphoric acid was prepared by evaporating the solution of orthophosphoric acid to dryness and gently igniting the residue. Of this, 10.550 grams were dissolved in 300 cc. of water, or 0.035 grams of acid to one cc. of water. Heat was avoided in dissolving, and the solution was used fresh.

Solutions of the following *metallic salts* were prepared, each in three degrees of strength, 5 per cent., 1 per cent. and $\frac{1}{2}$ per cent.

Barium chloride, absolute ;	Ferrous chloride, absolute ;
Calcium chloride, absolute ;	Ferrous sulphate, cryst. ;
Magnesium sulphate, cryst. ;	Lead nitrate, cryst. ;
Aluminium sulphate, cryst. ;	Lead acetate, cryst. ;
Ferric chloride, absolute ;	Silver nitrate, cryst.
Tincture of chloride of iron ;	

The *nitric acid* used for dissolving precipitates was 35 per cent. of hydrogen nitrate ; the *hydrochloric acid*, 24 per cent. ; and the *soda solution* used to neutralize phosphoric acid and produce precipitates was 7 per cent. of sodium oxide.

Another solution of same strength was prepared from common sodium phosphate by precipitation with lead acetate, and decomposition of the lead phosphate with hydrogen sulphide, the filtrate being freed from the gas. This solution was found to have a trace of sulphuric acid from contamination of the sodium phosphate with sulphate ; the testing of this salt having been neglected until the preparation was completed. The process worked well.

With ten per cent. solution of orthophosphoric acid :

Four cc. of the salt solutions treated with 1 cc. of the orthophosphoric acid.		Resulting pre- cipitates dis- solved by adding :	In 1 cc. salt sol. with 3 cc. phos. acid sol.		
			Soda sol. added to cause a precip.	Amt. phos. acid neu- tralized (grams). ¹	Proportion of phos. acid neu- tralized.
Barium chlor., 5 p. c.	No pre.	. .	1'0 cc.	0'110	36 p. c.
“ “ 1 p. c.	“	. .	1'5 cc.	0'116	59 “
Calcium chlor., 5 p. c.	“	. .	1'2 cc.	0'133	43 “
“ “ 1 p. c.	“	. .	1'6 cc.	0'177	59 “
Magnesium sul., 5 p. c.	“	. .	3'0 cc.	0'300	100 “
Aluminium sul., “	“	. .	1'6 cc.	0'177	59 “
Ferric chlor., 10 p. c.	“	. .	1'0 cc.	0'110	36 “
“ “ 5 p. c.	“	. .	3'0 cc.	0'300	100 “
“ “ tincture	“	. .			
Ferrous chlor., 5 p. c.	“	. .	3'0 cc.	0'300	100 “
Ferrous sul., “	“	. .	1'3 cc.	0'143	47 “
Lead nitrate, 5 p. c.	Pre.	8 cc. nitr. ac.			
“ “ 1 p. c.	“	2 cc. “			
“ “ ½ p. c.	“	1 cc. “			
Lead acetate, 5 p. c.	“	6 cc. “			
“ “ 1 p. c.	“	2 cc. “			
“ “ ½ p. c.	“	1 cc. “			
Silver nitr., 5 p. c.	“	7 cc. ortho. ac.			
“ “ 1 p. c.	No pre.	. .			
“ “ ½ p. c.	“	. .			

The lead precipitates were insoluble in excess of the orthophosphoric acid solution.

With six per cent. pyrophosphoric acid solution no precipitates were formed with any of the salt solutions named above, except those of ferric chloride, lead nitrate and acetate, and silver nitrate, which were formed as follows, on adding 1 cc. of the pyrophosphoric acid to 4 cc. of the salt solutions :

Ferric chloride, tincture; precipitate thick.

“ “ 10 p. c.; pre. soluble in 20 cc. of pyro. ac. or 5 cc. HCl.

“ “ 5 “ “ 5 cc. “ or 3 cc. “

“ “ 1 “ “ 2 cc. “ or 1'5 cc. “

Lead nitrate, 5 “ “ not soluble in pyro. acid, sol. in 1 cc. nitric.

“ “ 1 “ “ “ “ 0'3 cc. “

“ “ ½ “ “ “ “ 0'15 cc. “

Lead acetate, 5 “ “ “ “ “ 3 cc. “

“ “ 1 “ “ “ “ 0'8 cc. “

“ “ ½ “ “ “ “ 0'4 cc. “

Silver nitrate, 5 “ “ “ “ “ 0'5 cc. “

“ “ 1 “ no pre.

¹ The neutralization was predicated on formation of two-thirds metallic salt.

With three and a half per cent. solution of metaphosphoric acid:

Four cc. of the salt solutions treated with 1 cc. of the metaphosphoric acid:		Resulting precipitates dissolved by adding:	In 1 cc. salt sol. with 3 cc. metaphos. ac.		
			Soda sol. added to cause pre.	Amt. phos. acid neutralized.	Proportion of phos. acid neutralized.
Barium chlor., 5 p. c.	No pre.	. . .	0.4 cc.	0.076 grm	74 p. c.
Calcium chlor., 5 p. c.	"	. . .	0.4 cc.	0.076 "	74 "
" " 1 p. c.	"	. . .			
" " ½ p. c.	"	. . .			
Magnes. sul., 5 p. c.	"	. . .	1.7 cc.	0.307 "	292 "
Alumin. sul., 5 p. c.	"	. . .	2.0 cc.	0.361 "	343 "
Ferric chlor., 10 p. c.	Precip.	{ 12 cc. meta. ac. or 10 cc. HCl			
" " 5 p. c.	"	{ 5 cc. meta. ac.			
" " 1 p. c.	"	{ 2 cc. meta. ac. 1 cc. HCl			
" " tincture	"	large excess HCl			
Ferrous chlor., 5 p. c.	No pre.	. . .	1.0 cc.	0.180 "	171 "
Ferrous sul., 5 p. c.	"	. . .	0.5 cc.	0.090 "	85 "
" " 1 p. c.	"	. . .	1.0 cc.	0.180 "	171 "
Lead nitrate, 5 p. c.	Precip.	{ 10 cc. meta. ac. 1.4 cc. nitric ac.			
" " 1 p. c.	"	{ 2 cc. meta. ac.			
" " ½ p. c.	"	{ 0.7 cc. meta. ac.			
Lead acetate, 5 p. c.	"	{ 5 cc. meta. ac.			
" " 1 p. c.	"	{ 0.7 cc. nitr. ac.			
" " ½ p. c.	"	{ 1 cc. meta. ac.			
" " 1 p. c.	"	{ 0.4 cc. meta. ac.			
Silver nitrate, 5 p. c.	"	{ 8 cc. meta. ac.			
" " 1 p. c.	No pre.	{ 5 cc. nitric ac. . . .			

With the ferric chloride tincture, the thick white precipitate was only made gelatinous by addition of excess of the metaphosphoric acid.

In production of *metallic precipitates*, the sharpest distinction between the phosphoric acids appears to be, with ferric salts, between orthophosphoric acid and the other two. Both ferric pyrophosphate and ferric metaphosphate are soluble in excess of their respective phosphoric acids, if in water solution, but, in case of metaphosphate, not soluble in the alcoholic solution of the pharmacopœial tincture. Lead and silver salts are precipitated by each of the three forms of phosphoric acid; the lead metaphosphate being soluble in excess of metaphosphoric acid (a distinction from both the other phosphoric acids). The

distinction between ferrous and ferric salts, by metaphosphoric acid, is well defined.

The large excess of alkali required to give a precipitate in the mixture of metaphosphoric acid and certain salts, as aluminium and magnesium salts, may be due to the formation of soluble double metaphosphates, representing polymeric modifications of the monobasic acid.

The proportion of neutralized phosphoric acids (sodium phosphates) which can be present in solutions, without causing precipitates in salt solutions, is a question of interest, because of the presence of alkaline phosphate in the glacial acid and solutions made therefrom.

It was to determine this question, and also to settle some doubts as to how far the metallic precipitates, stated in the books for the *free* phosphoric acids, have been due to unknown presence of alkaline phosphates, that these experiments were made.

University of Michigan, November 14, 1876.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Composition of Xanthium Spinosum.—Yvon and Nocard have obtained from 100 parts of the air-dry plant 11.828 water, 76.518 of organic and 11.654 parts of inorganic matter. Among the organic constituents was found 10.632 starch, 0.808 glucose, 2.040 chlorophyll and resin soluble in ether, the remaining 63.038 consisting of cellulose, acids and probably an alkaloid. The mineral constituents were those usually found in plants, lime (2.454 p.) and magnesia (2.436 p.) preponderating. Not a trace of alkaloid could be detected in the decoction with acidulated water, which had been treated with milk of lime, and the precipitate digested with alcohol and chloroform; but by using alcohol, and following the process of Stas, liquids were obtained, which yielded precipitates with several of the general reagents for alkaloids. But similar reactions may be obtained on treating sandarac, olibanum and other resins in a similar manner.—*Rép. de Phar.*, 1876, p. 546.

Olive-tree bark as a febrifuge is recommended by L. Thibon, of Tournai, who has prepared from it a principle named *oliverin*, which he prepares as follows: The aqueous decoction of the bark is evaporated to a syrupy consistence; this is precipitated by strong alcohol, and the filtrate again by the careful addition of oxalic acid. The

filtrate from the last precipitate deposits the oliverin on slow evaporation. After washing with cold water it forms yellow granules, which are slightly odorous and very bitter. Dr. Fabry reports remarkable cures with this substance, which is given in the dose of 0.10 to 0.30 grams four or five times a day; the author requests physicians to try it in all cases where quinia is indicated.—*Ibid.*, 558.

Veratria.—Ernst Schmidt and R. Köppen have again examined this alkaloid as prepared by themselves from *sabadilla*, and from commercial alkaloid, and obtained results which in the main agree with those originally obtained by Merck ("Amer. Jour. Phar.," 1856, p. 134), except that they find its formula to be $C_{32}H_{30}NO_9$ ($O=16$). They also found Weigelin's observation (1871) correct regarding the existence of a *veratria*, which is soluble in water and may be obtained by precipitating a *veratria* salt by ammonia in the cold and washing it with cold water in which it gradually dissolves, but is reprecipitated by heat. On evaporating the solution in vacuo, a yellowish amorphous mass is obtained, which is again readily soluble in water and has the composition of the crystalline modification. The resinous mass, which is dissolved from the crude *veratria* by cold dilute alcohol, is another modification of the same alkaloid, differing from the first by not being crystalline, and from the second by the sparing solubility in water; the first and the last are gradually converted into the second modification by precipitating them in the cold and prolonged washing with cold water.

The authors have also examined samples of commercial *veratria* from six manufacturers, and found them pure and free from *sabadilla* and *sabatrina*, which are rather freely soluble in water; they dissolved completely in ether, in which *sabadilla* is insoluble.—*Ber. d. deut. Chem. Ges.*, 1876, 1115–1221.

The bark of Erythropheum guineense, the mancone of the Portuguese, contains an alkaloid, which was obtained in a crystalline state by E. Hardy and N. Gallois by exhausting the bark with alcohol acidulated with muriatic acid, evaporating, dissolving in water and decomposing by ammonia in the presence of acetic ether. The *erythropheïn* is crystalline, sparingly soluble in ether and chloroform, but readily in acetic ether. Physiologically, it acts as a muscular poison, acting primarily upon the heart, arresting its action in systole. The bark of *E. cuminga* contains an alkaloid having a similar physiological action.—*Chem. Centralbl.*, No. 40, from *Bull. Soc. Chim.*

Hops as a Ferment.—L. Pasteur has also made experiments with the view of throwing light upon the assertion of Sacc that hops contain a peculiar ferment (see this journal, pp. 320 and 467), and arrives at the conclusion that the presence of hops has no influence upon the fermentation of dough, and that its principal office appears to be, to impart to the bread a peculiar bitterish taste which may be relished by some persons.—*Ibid.*, No. 41, from *Comp. rend.*, vol. 83, p. 107.

Adonis vernalis, *Lin.*—F. Linderos obtained from the dried leaves of this plant, which are medicinally employed in some parts of Europe on account of their drastic properties, nearly ten per cent. of aconitic acid, which appears to be combined with calcium and potassium.—*Ann. Chem.*, vol. 182, p. 365.

Betulin was obtained by U. Hausmann from the light corky layer of the European birch bark, after exhausting it with hot water, by precipitating the alcoholic decoction with an alcoholic solution of lead acetate, heating the mixture to boiling and precipitating the hot filtrate with ammonium carbonate. On cooling, it formed a crystalline magma which was pressed and purified by repeated washings with little ether and recrystallizations from hot alcohol. It forms colorless long prisms, compressible to a shining felt-like mass, is easily rubbed to powder between the fingers, inodorous, tasteless, fusible at 250° C. (corrected 258° C.), and partly sublimes in thin needles. It is insoluble in water, but dissolves in alcohol, ether, benzol and chloroform. Its composition is $C_{36}H_{60}O_3$, and with acetic anhydride forms betulin-diacetate, a crystallizable ether. By dry distillation, oily products are obtained, which possess in a high degree the characteristic odor of Russian leather.—*Ibid.*, p. 368–380.

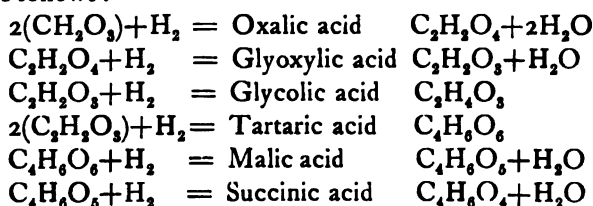
Glycyrrhizin was observed by Gorup-Besanez (1861) to be a glucoside, being split, when boiled with water, into sugar, and into the brown-yellow resinous glycyrretin. P. Weselsky and R. Benedikt have treated the latter with fusing potassium hydrate, and obtained from the fused mass paraoxy-benzoic acid ($C_7H_5O_3 \cdot H_2O$) as the principal product of decomposition.—*Ber. d. deut. Chem. Ges.*, 1876, p. 1158.

Vanillin is the sole odorous principle of vanilla, according to the investigations of F. Tiemann and Wm. Haarmann. The aqueous liquid which is obtained in the estimation of vanillin by their process (see page 132), yields to pure ether an organic acid, which was recognized

as vanillic acid, while the ethereal tincture which had been agitated with the solution of bisulphite of sodium, contains a fat which is occasionally rancid and a resin possessing, particularly when heated, a characteristic odor of castoreum, which is readily covered by the odor of vanillin. This was found to be the case with Mexican, Bourbon and Java vanilla; but the so-called vanillon, which has an odor resembling heliotrope, yielded besides vanillin and vanillic acid, an oil possessing the odor of oil of bitter almonds, and which is probably benzaldehyd.—*Ibid.*, p. 1285-1292.

Occurrence of glucose in alcohol.—G. Salomon has obtained from commercial alcohols residues which reduced oxide of copper. In one case he obtained from one litre 0.13 grams glucose, which impurity was most likely dissolved from the barrel in which previously other liquors may have been kept. This impurity is of particular importance in analytical investigations.—*Chem. Centralbl.*, No. 33.

The acids of the juice of unripe grapes.—Erlenmeyer and Hoster have rendered it very probable that the juice of unripe grapes contains glycolic and oxalic acids; Schwarz has found malic acid in it, and H. Schwarz and R. Brandenburg now announce the presence of succinic acid. If glyoxylic acid should be also discovered in the juice, the production of the acids can be explained by the reducing influence of light as follows:



—*Ber. d. deut. Chem. Ges.*, 1876, 982.

Reagent for Glucose.—A. Soldaini recommends to dissolve 15 grams of precipitated carbonate of copper in a warm solution of 416 grams potassium dicarbonate in 1400 c.c. of water. The reagent is reduced by grape- and milk-sugar, but not by cane-sugar, dextrin or starch-paste, unless they contain glucose. Normal urine, tartaric and uric acids are without action, but tannin and formic acid produce, when heated, a separation of cuprous oxide.—*Phar. Cen. Halle*, No 42.

Honey Artificially Colored.—A curious sophistication has been exposed

by Ch. Ménière. It appears that the more or less deeply colored honey from Bretagne is preferred in France for certain purposes; being rather scarce this year, it is manufactured in Paris by incorporating with honey a sufficient quantity of roasted bread, particularly the crust, which gives a yellow powder. By dissolving the honey in water the added powder may be collected upon a filter, and by this means the author has collected this novel adulterant in quantities ranging from 10 to 20 per cent. of the weight of the honey.—*Rép. de Phar.*, p. 610.

At the International Exhibition, just closed, there was some artificial honey, which appeared to be merely syrupy glucose flavored with a little honey.

Preparation of Artificial Wax.—A French patent, obtained by Pauvert, Moussay and Chauvin, gives the following directions:

1. Two parts of colophony (rosin) and one part of paraffin, or a similar hydro-carbon are fused together at 108° C.
2. Three parts of colophony are fused with one part of soap or stearic acid, and then washed with potassa solution. A little copal or vegetable wax may be added.—*Chem. Centralbl.*, No. 33, from *Bull. Soc. Chem.*

Preservation of Volatile Oils.—Well corked bottles, particularly if the cork is securely wrapped with thin gelatin, is recommended by E. Tornbory, of Jassy. As an instance of the security of the oils under corks, it is stated that, on digging a well at Salzwedel, there were found behind a wall, which probably belonged to the cellar when the building was destroyed by fire 200 years ago, two bottles containing oil of rosemary and of cloves, both being in a good state of preservation, although the corks were rotten and the oil of cloves of a brown color.—*Apotheker Zeit.*, No. 38.

Drying of Plants for the Herbarium.—As it is well known, the succulent plants (orchideæ, pinguicula, etc.) give the greatest trouble in drying, inasmuch as they easily lose their colors and become black, through incipient decomposition. It has been recommended to draw the plants slowly through a warm solution of 0.5 grm. salicylic acid in 300 grms. alcohol, shake well and dry in the usual manner in warm blotting paper, which has to be changed at least once a day.

Plants treated in this way dry quickly and preserve their colors

wonderfully. *Orchis morio*, *Orchis militaris*, *Syringa alba*, *Asperula odorata*, *Pinguicula vulgaris*, *Gymnadenia conopsea*, *Rhinanthus*, *Cephalanthera*, *Oenothera biennis*, *Verbascum thapsus*, *Petasites albus*, *Juglans regia*, *Pedicularis palustris*, all of which generally turn black in drying, keep their colors, especially the red and violet ones.—H. M. W., *Ny Pharm. Tid.*, 1876, p. 328.

New Method for the Volumetric Estimation of Silver.—Acid solutions of silver produce, with sulphocyanides, a white, curdy precipitate, resembling chloride of silver in appearance. In the presence of a ferric salt a blood-red coloration will be produced on the addition of every drop of the sulphocyanide solution, and quickly disappear as long as any silver remains in solution. The permanent appearance of the red color indicates the complete precipitation of the silver. This method, which has been proposed by Prof. J. Volhard, of Munich, is capable of very extended application, particularly for the estimation of chlorine, bromine, iodine and similar bodies, which are precipitated by silver from acid solutions.—*Phar. Cent. Halle*, No. 39, from *Jour. f. prakt. Chem.*

Recovery of Silver from Solutions of Silver Cyanide and on the Reduction of Silver Chloride.—Ernst Von Bibra has examined the various methods proposed, and recommends to precipitate the solutions with sulphuric acid, ignite the precipitate, digest with nitric acid and precipitate by hydrochloric acid. The precipitated silver chloride is treated by Gräger's process by adding ammonia and digesting with zinc. The greyish or whitish precipitate gradually becomes deep grey, almost black, and then contains zinc, which is extracted by dilute sulphuric acid, or better, by boiling with dilute hydrochloric acid, when pure silver is left behind.—*Jour. f. prakt. Chem.*, 1876, pp. 185–192.

Notes on Sumbul.—The *Euryangium sumbul* is found in large quantities in the neighborhood of Chabarowka, a military post on the river Amur, in the province of Küsten, East Siberia, 9,000 versts from St. Petersburg. It is a perennial umbellifer, and grows to the height of from 3 to 5 feet. Its root is branched, fleshy, about 11 inches in circumference at the base, and $3\frac{1}{2}$ inches in diameter, with numerous rootlets, and covered with a brown bark. The root has a strong smell of musk, which, by moistening with water, is considerably increased. The stalk of the plant is always fleshy, equal in circumference at the base

with the root, becoming gradually more slender towards the top. The leaves are more than twice pinnatifid, the pinnæ lancet-shaped, sharply serrate, the umbels with 30 to 50 rays, the flowers white and small.

Besides the *Euryangium sumbul*, the author has met with another umbellifer, which resembles it very much in its entire habit, but may be distinguished by its smaller size, lighter leaves, and the absence of the musk-like smell of the root.

The Eastern Russian inhabitants call the *Euryangium sumbul* "Bärenklau" (bear's claw), and use the root as a medicine. The Chinese living in the district use the root of the plant against various diseases, and call it "Lsbuma-tschen-tuk." It is also used by the natives internally as a remedy for swellings; with them it bears the names "Ofuokgi" and "Ouchi."

The author promises a future communication, giving the results of an examination of the separate constituents of the root as it is found in the district of Chabarowka.—Karl Wittmann, *Phar. Journ. and Trans.*, Oct. 21, from *Ph. Zeitsch. f. Russland*, vol. xv, p. 545.

A NEW BASIS FOR CANTHARIDES PLASTER.¹

BY A. W. GERRARD.

Teacher of Pharmacy to University College Hospital.

In a report upon the official plasters presented by me before the meeting of our Conference held in London in 1874, the cantharides plaster was omitted from the list, as my experiments upon it were not then concluded. Mr. T. Groves, who was the president of the Conference for that year, remarked, in his discussion of my report, that the blister plaster was the only one in which he believed, therefore I thought it too important a matter to overlook, and am now in a position to lay the subject before you.

The basis of our present cantharides plaster, as is known, consists of a mixture of wax, prepared suet, resin and lard. In my experience with this basis, the most important faults it possesses are insufficiency of adhesiveness and flexibility, and by reason of this, after it has been spread a few days, and more especially during the winter months, it becomes brittle, cracks and peels from the surface of the material upon which it is spread. To overcome these objections it was necessary to alter the proportions of its present ingredients, or seek a new

¹Read before the British Pharmaceutical Conference.

formula. I chose the latter, for I considered the presence of a granular body like mutton fat a quite unnecessary and useless ingredient, and to be the main cause of the objections urged. After numerous trials with mixtures of various proportions of wax, resin, fats and oils, most of which answered my object but indifferently, I tried Canada balsam, and found that when mixed with wax and lard in the following proportions it gave a very good result :

Take of

Cantharides in fine powder	6 ounces.
Canada Balsam	8 "
Yellow Wax	5 "
Lard	1½ "

Dissolve the wax, lard and balsam over a water-bath, add the cantharides, and allow them to macerate at a gentle heat for one hour, then stir till cold ; during the winter months the lard may be doubled with advantage.

In deciding upon the above proportions, I have borne in mind that the plaster should be only just sufficiently adherent that on its removal from the patient the blister is not torn.

Plaster prepared according to this form has been on its trial for some time, it produces a good blister in from four to eight hours, and I have had no complaints concerning it. For experiment I placed a small plaster of this formula, and one of the B.P., upon my own arm, the former was seven hours and the latter nearly eight hours producing the desired result.

Canada balsam is, I consider, well adapted for the purpose I have chosen it, as from its terebinthinate character it has a solvent action upon the wax, which imparts to the mixture the desired qualities of adhesion and flexibility ; it is also probable that it aids the extraction of the cantharidin from the flies.

A German pharmacist, whose name I am unable to call to mind, has stated that an advantage is gained by treating the cantharides by the following process before making them into plaster : Digest the powdered flies with caustic soda, cantharidate of soda is formed, neutralize this with hydrochloric acid, cantharidin is liberated and chloride of sodium produced ; the mass is then dried and mixed with the basis, the chloride of sodium being in no way detrimental. I tried the experiment, but obtained no apparent advantage.

A blistering plaster may sometimes fail from the bad quality of the flies, and in this matter if there is any suspicion, I think the judgment would be much aided by the use of a microscope. There are other causes of failure, such as the plaster being insecurely applied, or the patient's skin may be of that nature that vesicants will not affect it; these matters are outside our control. I have only attempted that which is within it, and believe the form I have given for cantharides plaster will be found an improvement on that to which we have been accustomed.

NOTE ON SALICYLATE AND SULPHOSALICYLATE OF SODIUM.¹

BY JOHN WILLIAMS, F.C.S.

Salicylate of sodium has been much employed lately as an internal remedy.

It is made by neutralizing a solution of salicylic acid with caustic soda, and evaporating to dryness. It can be purified by crystallization from alcohol; the crystals formed are, however, very small and indistinct, and this method of purification is not generally adopted.

Complaints have appeared in the medical journals that the salt sometimes produces irritative effects when administered medicinally, and it has been suggested that probably a trace of carbolic acid may occasionally be retained by the salicylic acid made by artificial means, and thus the salt prepared from such acid is impure.

An examination of the salicylic acid made from carbolic acid by Kolbe's process soon proves that the product is not always to be depended upon as a pure homogeneous article; indeed it can hardly be otherwise, when we consider that the carbolic acid from which it is made is itself not an absolutely pure or definite article. Still, I must observe that the salicylic acid now being supplied is much purer and more definite than that which was at first sent into the market by the German makers.

Thus salicylate of sodium—made from the artificial acid—and from the great difficulty of purifying it by recrystallization—is liable to be more or less impure, and indefinite in composition. It thus appears desirable, if possible, to obtain a salt which can be purified, and obtained of definite constitution.

Sulphosalicylic acid appeared to offer such a compound. It was

¹ Read before the British Pharmaceutical Conference.

discovered many years back by Cahours, and has been further investigated by Mendius. The process described for its production is, however, one of considerable practical difficulty.

The vapor of anhydrous sulphuric acid is passed over salicylic acid kept cool ; gradually a sticky, gummy mass is produced, which contains the new acid, and can be separated by appropriate means.

I have made several attempts to produce this conjugated acid by means of ordinary sulphuric acid, and have at length succeeded in doing so, but not without several failures. I find the following process to answer :

The salicylic acid must be very pure ; the unpurified commercial acid, when treated with sulphuric acid, simply yields a black mass, giving off sulphurous acid, and yielding no sulpho-salt capable of giving definite crystals.

If pure acid is employed, then about twice its weight of sulphuric acid is quite sufficient. The mixture must be gently heated in a sand-bath up to about 100° C., when action will commence in the liquid, and considerable heat be developed. The beaker must be removed from the sand-bath, and the contents stirred, so as to regulate and keep down the temperature ; but the cooling must not be sufficient to altogether check the reaction. If the temperature exceeds the proper point, little or no sulphosalicylic acid is produced, but apparently bisulpho-carbolic acid, which does not yield definite crystallizable salt.

When the reaction has been properly maintained, at the end of ten minutes or a quarter of an hour the temperature begins to fall and in a short time the whole becomes a solid mass, generally of a light brown color ; this will speedily deliquesce if left exposed to the air ; but it can be dissolved in water at once, and treated with carbonate of barium in the usual way. I may mention that as the sulphosalicylate of barium is not a very soluble salt, it is necessary to employ a considerable quantity of water, and filter the liquid while still hot. This solution of the barium salt, decomposed by an equivalent quantity of sulphate of sodium, which yields a solution of the sulphosalicylate of sodium upon evaporation to a small bulk, yields crystals ; these crystals must be pressed from the mother-liquor and purified by recrystallization two or three times from hot water.

When pure, sulphosalicylate of sodium forms hard white prisms ; it is not deliquescent, although very soluble in water. It is almost insol-

uble in alcohol, has no caustic, but a slightly bitter taste, and is altogether a salt well adapted, I think, for medicinal use.

Salicylic acid and its salts give, as is well known, a striking reaction with perchloride of iron, producing a dark purple coloration. The sulphosalicylates produce exactly the same reaction, proving that the salicylic acid radical is still intact in these compounds, and it is fair to infer that the medical properties of these sulpho-salts will be found in practice to be identical with, or perhaps superior to, the simple salicylates.

We have in the analogous case of the carbolate and sulphocarbolate of soda an instance in which the sulpho-salt possesses great advantages over the simple salt, and such may prove to be the case with the sulphosalicylates.

The acid itself is crystallizable, but deliquescent; the zinc salt is also very deliquescent. I have not paid any attention to the other salts as yet.

NOTE ON THE CONDITION IN WHICH SALICYLIC ACID IS EXCRETED BY PATIENTS.¹

BY F. BADEN BENDER, F.C.S.

The question whether or not salicylic acid ever exists in a free, and therefore active condition, in the urine of patients being of some importance, the following experiments were made, and the results are offered as a small contribution towards a settlement of the point.

The urine of a patient who had taken 60 grains of salicylic acid during the day was collected in the evening and the following morning. It was slightly acid to test paper, and gave the purple reaction with ferric chloride characteristic of salicylic acid and its salts. A portion shaken with bitter almond meal in the proportion of two grains to the fluidounce immediately developed the odor of bitter almond oil. In a similar portion treated with two grains of mustard flour to the fluidounce, the odor of mustard oil was at once perceptible; mixed with forty grains of sugar and half a grain of German yeast to the fluid ounce, fermentation rapidly took place. Five fluidounces were evaporated to half an ounce, thoroughly shaken with its bulk of ether, the ethereal solution evaporated to dryness, and the residue dissolved in one fluidounce of sweetened water; to this half a grain of yeast was added,

¹Read before the British Pharmaceutical Conference.

and fermentation immediately commenced. A portion set aside in a warm place decomposed with the same rapidity as another specimen of urine containing no salicylic acid or its salts.

Parallel experiments were then made with urine in which salicylic acid had been dissolved in the proportions of $\frac{1}{2}$ grain, $\frac{1}{2}$ grain, 1 grain and 2 grains, to the fluidounce. Sweetened with sugar, and half a grain of yeast to the fluidounce added, the $\frac{1}{2}$ grain and $\frac{1}{2}$ grain solution fermented more or less rapidly, the 1 grain solution slightly in twenty-four hours, whilst that containing two grains to the ounce remained unaffected. Mixed with bitter almond meal, two grains to the fluidounce, the $\frac{1}{2}$ grain solution prevented the production of bitter almond oil, but with mustard flour in the same proportion a slight odor of mustard oil was apparent, nor did the 1 grain solution entirely prevent its production. Similar experiments were then made with aqueous solutions of salicylic acid, and $\frac{1}{2}$ of grain of acid to the fluidounce was found to be sufficient to prevent the action of $\frac{1}{2}$ grain of yeast on 1 fluidounce of sweetened solution. Smaller quantities only slightly retarded the action. A larger proportion of salicylic acid was required to prevent the action of yeast on sugar than has been recorded by some experimenters, and, as might be expected, more acid was required to produce the same effect in sweetened urine than in sweetened water, some of it probably combining with the alkaline phosphates present; nevertheless, these experiments, as far as they go, seem to indicate that, at all events in the case under observation, the acid was not excreted in an active condition.

In connection with this subject, some experiments were made with urine in which salicylate of sodium had been dissolved in the proportions of 1, 2, 3, 4 and 5 grains to the fluidounce, 40 grains of sugar and half a grain of yeast were added to an ounce of each. The one grain and two grain solutions fermented rapidly, the three and four grain solutions less rapidly, and the five grain solution remained unaffected by the ferment.

Solutions of salicylate of sodium in urine appeared to exert no retarding action on the production of oil of mustard, or oil of bitter almonds. Aqueous solutions of salicylate of sodium acted in a similar manner.

It has been stated that the salts of salicylic acid do not possess anti-septic properties, but it is evident that salicylate of sodium is capable of preventing fermentation if present in the proportion named.

ON AN ALKALOID OBTAINED FROM JABORANDI, ITS PLATINIC COMPOUND, AND THEIR FORMULÆ.

BY CHARLES T. KINGZETT.

In 1875 an alkaloid was isolated from the leaves and stalks of jaborandi (*Pilocarpus pennatifolius*, of Lemaire), almost simultaneously and quite independently by Mr. A. W. Gerrard and M. Hardy (*"Amer. Jour. Phar."*, 1875, pp. 214 and 315). There is another kind of jaborandi, a species of Piper, from which Parodi has isolated an alkaloid of the formula $C_{20}H_{12}N_2O_8$.

To the alkaloid upon which M. Gerrard worked, the name of pilocarpina has been given. He has detailed the methods of extraction, and states that it forms crystallizable salts with hydrochloric, nitric and sulphuric acids. He further exhibited some crystals of the so-called hydrochloride in a dark-brown mother-liquor, at the last meeting of the Pharmaceutical Conference, but neither at that time nor since has he, or M. Hardy, or any other observer, published any formulæ for the alkaloid or its compounds. Mr. Gerrard has further stated his opinion that there are at least two alkaloids in jaborandi, and that the one upon which he worked gave no precipitate with phosphomolybdic acid. Several other papers relating to this subject will be found in the "Year Book of Pharmacy" for 1875.

More recently Hardy states that he has obtained from the distillate of an aqueous extract of the leaves of jaborandi a quantity of crude oil, containing a terpene which gave a crystalline di-hydrochloride. But the boiling point of 178° C., which he attributes to the hydrocarbon, would rather point to cymene than to a terpene. He also obtained a solid, colorless substance, which was not further examined (*"L'Union Pharmaceutique,"* vol. xvi, p. 365). My first experiment was conducted upon the leaves of the plant. These were thoroughly extracted with water of 70° C., and the extract concentrated to a small bulk, filtered from deposited matters, rendered acid by hydrochloric acid, and fully precipitated with phosphomolybdic acid. The bright yellow precipitate, after thorough washing, was decomposed after the method of Sonnenschein, that is by heating with excess of baryta, and the excess of barium was removed by carbonic acid. The filtrate was strongly alkaline, and was found to contain barium. This barium was carefully removed by sulphuric acid, and the filtrate, which gave the characteristic reactions of an alkaloid with various reagents, was converted into

hydrochloride, but all attempts to obtain crystals by concentration on a water-bath, or in a vacuum over sulphuric acid, or by spontaneous evaporation, proved vain.

In the next experiment I took the stems and twigs of jaborandi, and extracted them after they had been cut up into small fragments, with boiling water, until the last extract contained no appreciable quantity of matter.

The extract was distilled to a small bulk, and it was observed that the first few litres of distillate came over milky, and that on standing yellow oily drops deposited. The small quantity and its volatile nature defeated an attempt made to isolate it. The concentrated water-extract obtained as above was treated with an equal volume of strong alcohol, which threw down dark-colored albuminous matter, &c. From the filtrate the whole of the alcohol was distilled off, and a great part of the water. The syrup of 300 cc. was now extracted with much ether. Next ammonia was added, as Mr. Gerrard stated in a letter to me that he had found the alkaloid in the water extract was combined with an acid, and the whole was again extracted with ether. Finally the syrup containing ammonia was extracted with chloroform.

The first ether extracts were strongly colored; the after ones only faintly; the chloroform ones not at all. From all these extracts the solvents were distilled, and after many and various unsuccessful attempts to get the residues combined separately in a crystalline form with hydrochloric acid, no sign of crystallization ever being obtained, all the products were united, ammonia added, and the whole again extracted by chloroform. The chloroform extracts on distillation left a colored aqueous syrup, which was rendered strongly acid with nitric acid, and gave a bulky yellow precipitate with phospho-molybdic acid. This precipitate was passed through the same treatment as that described above in the first experiment. The free base was found to contain barium, which was removed exactly by very dilute sulphuric acid, after which the whole was concentrated to a syrup of a pleasant nutty odor. The product was now acidified faintly with hydrochloric acid, and another attempt made to get a crystallization, both by evaporation on a water-bath and *in vacuo*, etc., but as before, quite in vain.

I therefore now removed the hydrochloric acid by dilution with water and agitation with oxide of silver, and evaporated the filtrate to

dryness, after digestion with charcoal, which removed much of the color. The residue was dissolved in absolute alcohol, filtered from a trace of reduced silver, and again evaporated to dryness, and the drying completed in an air-pump over sulphuric acid during a fortnight. The product was now analyzed, all combustions being effected in platinum boats, as the matter was soft and plastic, like gum.

(a.) 0.0204 grm. gave by combustion *in vacuo* with CuO and metallic copper, 21.8 cc. CO₂, and 1.8 cc. N normal, showing the relation of the N : C to be 1 : 6.

(b.) 0.1872 grm. gave by combustion with PbCrO₄ and metallic copper, 0.3762 grm. CO₂, and 0.1404 grm. H₂O = 54.80 per cent. carbon, and 8.33 per cent. hydrogen.

Synopsis of Analysis.

	+ at. wgt.	+ N = 1.
C = 54.80	4.566	5.80
H = 8.33	8.33	10.50
Frankland's process N = 11.03	.787	1.0
O = 25.84	1.615	2.0
<hr/>		
100.00		

After the above analysis was completed, the rest of the alkaloid was dissolved in 87 per cent. alcohol, and treated with alcoholic platinic chloride, when a bulky precipitate was produced, but slightly soluble in cold, readily soluble in hot water. The yellow solution on concentration gave a crop of reddish-yellow octohedral crystals, which were isolated, rinsed with water, dried at 80° C., and analyzed.

(a.) 0.0404 grm. gave by combustion *in vacuo* with CuO and Cu, 26.2 cc. CO₂, and 2.3 cc. N normal, giving as the relation of N : C 1 : 5.7; and the percentage of N = 7.12.

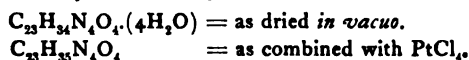
(b.) 0.3532 grm. gave with PbCrO₄ and metallic Cu 0.412 grm. CO₂, and 0.142 grm. H₂O = 31.81 per cent. C.; and 4.46 per cent. H.

(c.) 0.2120 grm. gave 0.0496 grm. platinum, and 0.2128 grm. AgCl = 23.39 per cent. Pt, and 24.83 per cent. Cl.

Synopsis of Analysis.

	+ at. wgt.	+ Pt = 1.	
C = 31.81	2.65	22.4	} or C ₂₂ H ₃₅ N ₄ O ₄ .2HCl.PtCl ₄ .
H = 4.46	4.46	37.7	
N = 7.12	.508	4.3	
Pt = 23.39	.118	1.0	
Cl = 24.83	.669	5.6	
O = 8.39	.524	4.4	

Now the analysis of the free alkaloid led to $C_{5.8}H_{10.5}NO_2$. Multiplying this by 4, and deducting $4H_2O$, we obtain the above formula derived from the analysis of the platinum salt :



In conclusion, I have to express my indebtedness to Dr. Thudichum for having kindly placed his laboratory at my disposal during the prosecution of the foregoing research.—*Jour. Chem. Soc.*, Oct., 1876.

CHEMICAL EXAMINATION OF FÜH-LING (*Lycoperdon Solidum*) FROM CHINA.

BY J. L. KELLER, OF CHARLOTTESVILLE, VIRGINIA.

Among a number of interesting specimens which Mr. Justus Eck, of London, was kind enough to present, some two or three years ago, to the laboratory collections of this University, was one of this curious material, accompanied by the following extract in reference to it from the late Mr. D. Hanbury's "Notes on Chinese Materia Medica :"

"Füh-ling; *Pa-hyma cocos*, Fries (*Fungi*); *Lycoperdon solidum*, Gronovius; Pé-fo-linn, Cleyer (*Med. Sin.*, No. 189), Tafarirov (*Cat. Med. Sin.*, pp. 2-23); Puntsaon; Indian Bread; or Tuckahoe. A very large remarkable substance resembling ponderous rounded tubers having a rough blackish brown bark-like exterior, and consisting internally of a compact mass of considerable hardness, varying in color from cinnamon brown to pure white. These tuberiform bodies, which in weight vary from a few ounces up to several pounds, are found attached to the roots of fir trees, or sometimes buried in the ground of localities where firs no longer grow. They occur in South Carolino,¹ in some of the northern and western provinces of China, and in Japan. Their true nature is sufficiently perplexing. The older writers considered them to be a sort of China root (*Smilax*), a supposition which their outward appearance certainly favors, but which is immediately negatived when we find them to contain no trace of starch. Loureiro and Endlicher are content to describe them as tubers found upon the roots of fir

¹ They are by no means peculiar to this State. I have seen specimens found at various points from Virginia to Alabama on the Atlantic side of the country, and, as will be seen by the quotation from *Report of the Department of Agriculture*, they extend as far west as Kansas.

trees. Other botanists have placed them among fungi; Gronovius and Walter in the genus *Lycoperdon*; Schweinitz in *Scleroticum*; Okur and Fries in *Pachyma*. The latest observations on the subject are some which were submitted to the Linnean Society by Mr. F. Currey and myself last year (1861) and published in the *Linnean Transactions*. The opinion there expressed is that these tuber-like bodies are an altered state of the root of the tree, probably occasioned by the presence of a fungus, the mycelium of which traverses, disintegrates or even obliterates the wood and bark. This mycelium appears under the microscope in the form of fine threads usually more or less mixed with bodies of irregular shape, somewhat resembling starch granules, but which are apparently cells of the woody tissue in a more or less advanced state of disease and distortion. Nothing is known of the more developed form of the fungus represented by the mycelium. The American Füh-ling has been examined chemically by Professor Ellett, of South Carolina College, who has stated it to consist entirely of pure pectin of Braconnot, but I think its composition deserves some further investigation. I find that the pure white internal substance (which is quite insipid and inodorous) is very slightly soluble in cold rectified spirit and in cold water, and not more so when boiled in water, the solution in each case yielding a flocculent precipitate with acetate of lead. When boiled in a weak solution of carbonate of soda the substance dissolves rather more freely, and the solution affords a scanty gelatinous precipitate (pectic acid) when treated with an acid, or (pectate of lime) with a solution of lime. In China the Füh-ling is made into edible cakes, which are frequently sold in the streets; it is also reported medicinal in a variety of disorders. In America it has also been used as an article of food, whence the name Indian bread."

The *Report of the U. S. Department of Agriculture* for 1870 (p. 423), in an article upon materials used as food by the North American Indians, has the following notice of this substance:

"*Tuckahoe or Indian Bread (Lycoperdon solidum).*—Two specimens of this fungus are in the collection of the Department of Agriculture—one from Nottoway Co., Virginia (fig. 1, plate 10), the other from Leroy, Kansas (fig. 2, plate 20). These singular fungous growths are subterranean and parasitic on the roots of large trees. A piece of root is often inclosed in the mass. The form is irregularly globose, about the size of a man's head. It is very rugous

and filled with cracks ; the color externally is ashy black, in the interior white or nearly so, of a starchy appearance, very firm, and breaks into irregular masses. The Kansas specimen is rounded in shape, with a black, rough exterior, and a white and compact interior. When broken it has the appearance of a mass of dried dough, full of fissures and very granular. Booth and Morfit's *Cyclopædia of Chemistry* gives the following under the article of 'Picquotaine,' a highly nutritious plant used as food by Indians. It results from a disease of the *Psoralea esculenta*. Its composition is as follows: Nitrogenous matter, 4.09; mineral substances, 1.61; starch, 81.80; water, 12.50." The following remarks relative to the Tuckahoe are furnished by Dr. John Torrey: "It was first brought to the notice of the public by Dr. Clayton, who sent it to Gronovius under the name of *Lycoperdon solidum*, and as such described it in the *Flora Virginica* about one hundred and twenty years ago. Next it was described by the late Dr. von Schweinitz, in his 'Synopsis of the Fungi of North Carolina,' under the name of *Sclerotium cocos*. About the same time Dr. Macbride, of Charleston, South Carolina, sent to the Linnean Society of London his observations on that fungus. Without being aware of having been anticipated by Schweinitz, I described it in the 'New York Repository' about the year 1819, under the name of *Sclerotium giganteum*. I gave also a chemical analysis of it, showing that it is chiefly composed of a singular substance which I named sclerotin. Braconnot some years after this described the same principle, which he called pectin. In the *Synopsis Fungorum* of Fries, the fungus is called *Pachyma cocos*. In the *Proceedings of the Linnean Society of London* is an account by Rev. M. J. Berkeley of a large subterranean fungus that is sold as food in the streets of Shanghai, undoubtedly the same as the Tuckahoe."

And in the *Report* of the same Department for 1871 (p. 98) occurs the following from R. T. Brown, Chemist to the Department:

"*Tuckahoe or Indian Bread*.—This curious fungus (*Sclerotium giganteum*) is quite common in many parts of the Southern States, where it is frequently used as an article of food.¹ To determine its nutritive

¹ This is certainly an over-strong way of stating the facts. Specimens of the material in question are not very rare, and they are occasionally eaten by the negroes of the Southern States, but the substance can by no means be said to be common, or commonly used as an article of food. In the analysis there is obviously a little error of statement in reporting elementary nitrogen and accounting for all that remains of 100 per cent. in non-nitrogenous material.

value a specimen from Columbia, Virginia, was subjected to careful analysis in this laboratory, with the following results :

" Moisture	14.16
" Glucose (fruit sugar)	0.93
" Gum	2.60
" Pectose	17.34
" Nitrogen in an insol. combination	0.36
" Woody fibre	64.45
" Ash	0.16
	<hr/>
	100.00

" This analysis does not sustain the high reputation of this substance as a food material."

The substance received from Mr. Eck being from China, while all the above statements as to chemical composition refer to material from America, and these statements differing so widely from each other, it seemed well to make a new analysis, which was done by Mr. Keller.

The specimen of Chinese Füh-ling examined was kidney-shaped, about 6 inches in longest diameter, and $3\frac{1}{2}$ inches in shortest, and weighed about two pounds and a quarter. The rough, brownish-black bark-like exterior was about an eighth of an inch thick, verging gradually into the perfectly white uniform mass inside. The whole was compact and firm, but easily cut with a saw, and the fragments, after removal of the exterior crust, showed but little toughness and were easily crushed in a pestle and mortar. A sufficient quantity was reduced to fine powder, passed through a sieve, and thoroughly mixed. This powder yielded little soluble matter to either cold or hot water, but was much more freely dissolved by a dilute solution of hydrate or carbonate of sodium, the liquid produced in each case giving a flocculent gelatinous precipitate (corresponding in character to pectic acid) when treated with an acid or alcohol, such precipitate proving excessively difficult to wash. Starch and cane-sugar were carefully tested for, but none could be found.

The quantitative analysis was made as follows: Water was determined by prolonged exposure to $110^{\circ}\text{C}.$; albuminoid matter was calculated from the amount of nitrogen, determined by combustion with soda lime. For the organic matters soluble in water the powder was exhausted with water by repeated boiling, keeping the flask full of steam so as to exclude air; the liquid rapidly filtered, and evaporated (in a retort exhausted by a Bunsen's pump) to a small bulk. The

solution was then divided into two parts, continuing the evaporation of the one to dryness at 100°C., weighing the residue as soon as it ceased to lose moisture, incinerating, and weighing the ash left; while the other was separately evaporated to dryness, exhausted with dilute alcohol (which took up a little glucose), and the residue dried at 100°C. and weighed; this being burned and the weight of ash plus the previously determined weight of albuminoid matter deducted, the quantity of gum was found by difference. In the dilute alcoholic solution glucose was determined by Fehling's copper solution. The pectous material was dissolved out from what water had left by repeated boiling with a dilute (1½ per cent.) solution of sodium hydrate, and precipitated by dilute sulphuric acid and alcohol, but it was found to be almost impossible to wash the slimy precipitate, and it could not have been relied upon as unaltered in weight from the original insoluble pectous material, so that this was estimated by difference. The cellulose left undissolved by the sodium hydrate was treated with very dilute sulphuric acid (in the cold and for a short time only), then thoroughly washed with water, thrown on a weighed filter, dried at 100°C and weighed; after burning the weight of the ash was deducted. The results were:

Glucose	0·87	} Org. matter—	
Gum (with a trace of acid)	2·98		
Albuminoid matter	0·78		
Pectose	77·27	} Org. matter—	
Cellulose	3·76		
Mineral matter, sol. in water	0·08	} Ash	
“ insol. in water	3·56		
Water	10·70	Water	10·70
	<hr/> 100·00		<hr/> 100·00

These figures, especially if taken in connection with Mr. R. T. Brown's results, are strongly suggestive of the correctness of the opinion of Messrs. Hanbury and Currey as to the general nature of the substance, viz.: that it represents woody fibre altered by the interpenetration of a fungus mycelium. In the specimen analyzed by the Chemist of the Agricultural Department the alteration seems to have been incomplete, leaving a good deal of unchanged cellulose; in the case now under notice the cellulose has nearly disappeared. The very small amount of nitrogen renders the notion of the whole mass being simply an independent and developed fungus very unlikely.

Mr. Keller also made an analysis of the ash, to obtain which about 100 grms. of the substance was incinerated at a very low temperature in porcelain crucibles placed each within another of sheet iron serving as a hot air bath. The ash was tolerably free from remaining charcoal. Chlorine, carbon dioxide and silica were determined from the whole amount used; and after dividing the solution into two portions, sulphuric oxide and the alkalis were obtained from the one, and phosphoric oxide, ferric oxide, lime and magnesia from the other. The analysis afforded:

Crude Ash.		Pure Ash. (Deducting Sand, Charcoal and Carbon Dioxide.)	
K ₂ O	2.062	K ₂ O	4.675
Na ₂ O	0.967	Na ₂ O	2.192
CaO	2.280	CaO	5.169
MgO	5.017	MgO	11.375
Fe ₂ O ₃	5.208	Fe ₂ O ₃	11.808
P ₂ O ₅	8.725	P ₂ O ₅	19.781
SO ₃	0.700	SO ₃	1.587
Cl	0.724	Cl	1.642
SiO ₂	18.424	SiO ₂	41.771
CO ₂	2.813		
Charcoal	2.209		
Sand	50.546		
	99.675		100.000
Deduct O equiv. to Cl	0.163	Deduct O equiv. to Cl	0.370
	99.512		99.630

The large amount of sand is not caused by want of care in removing the exterior portions of the mass. With a lens sparkling little siliceous grains can be detected on a perfectly clean cut surface of the interior. This again accords with the idea of a fungoid growth pushing its way in a sandy soil into disintegrating woody tissue, and cannot at all be conceived of as a result of simple independent vegetable growth. Part of the large percentage of silica found to be soluble, and perhaps of the iron also, may very likely be also mechanically derived from the soil, but how much we have no means of determining.—*Chem. News*, Oct. 20, 1876.

ANALYSIS OF FIFTEEN SAMPLES OF TEA. ALSO, AN INVESTIGATION OF METHODS OF DETERMINING THE TANNIN OF TEA.

BY J. T. CLARK, PH.C.

In estimation of the portion soluble in water, one gram of the tea was boiled briskly¹ for fifteen minutes with 50 cc. of water and the clear

¹ Wanklyn: "Tea, Coffee and Cocoa Analysis," p. 15.

solution carefully decanted; the residue boiled again with the same quantity of water and the clear solution decanted; the residue then dried on the water-bath and weighed, the loss being taken as the quantity sought.

The *determination of the tannin* in the decoction was tried by four of the numerous methods in use, without obtaining very nearly concurrent results from triplicate operations with each method. The method recommended by A. H. Allen,¹—precipitation by standard solution of lead acetate, in presence of potassium ferricyanide as an indicator, was used for No. 1,—19 per cent. being the mean of three estimations, with a variation of nearly 5 per cent. The difficulty consisted in perceiving the pink color made with the indicator, masked as it is by the color of the tea decoction. The result given for No. 2 is the average of three varying determinations by Wagner's method with a standard solution of cinchonia.²

The variation was due to the difficulty in recognizing the red color of the indicator in the solution, distinct from the colored precipitate, in presence of the tea color. No. 3 is given in the table as the average of three trials of the method of Hager,³ by the diminution of density from removal of the tannin by copper oxide. The results were widely divergent—showing that this method which was proposed for oak-bark is not applicable to tea. No. 6 was worked volumetrically by solution of gelatin (Müller's method); three determinations giving considerable differences.

A volumetric method for tannin was then tried, with *use of standard solution of cinchonia sulphate in excess, titrating back in the filtrate with standard solution of potassium mercuric iodide*. Triplicate operations were tried on No. 4 and No. 5—the results for each number differing but slightly. The remaining numbers were worked by the same method: Nos. 10 and 12 being confirmed by closely agreeing duplicate results. The solution of cinchonia sulphate is Wagner's standard (before quoted): 4.523 grams cinchonia sulphate, with 0.5 gram sulphuric acid, in water to make one litre. The potassium mercuric iodide solution is Mayer's standard: 13.546 grams mercuric chloride

¹ "Chem. News," xxix., 169, 189.

² "Zeitsch. f. anal. Chem.," v., 4, 8; vii., 139.

³ "Untersuchungen," II., 115.

and 49.800 grams potassium iodide in water to make one litre. To the clear and dilute decoction of one gram of the tea, obtained as above described, the cinchonia solution is added from the burette to slight excess and the quantity noted, the mixture filtered and the residue washed. Unless some means for "rapid filtration" be used, this part of the operation is very slow, but with any "filter pump" it is altogether satisfactory. To the filtrate with the washings the iodide solution is added, stirring until the precipitate is complete. The precipitate subsides quickly, and a drop of the clear solution on a blue or black glass slide treated with a drop of the reagent (from the burette) will show if farther precipitate can be obtained (the drops so taken being then rinsed into the mixture tested). Each cc. of the iodide solution precipitates 0.0102 gram of cinchonia, or 0.0124 gram of cinchonia sulphate, or 2.74 cc. of Wagner's standard solution of cinchonia sulphate. Each cc. of the last named solution precipitates 0.01 gram of tannic acid. Having the decoction of one gram of tea: cc. cinchonia sol.— $(2.74 \times \text{cc. iodide sol.}) = \text{per cent. of tannin (in its equivalent of tannic acid)}$.

The reports of *the proportion of tannin* in tea show remarkable differences. A. H. Allen, by volumetric determination with lead acetate as previously described, finds about 20 per cent. tannin in green tea and an average of 10 per cent. in black tea. G. W. Wigner ("Phar. Jour. Trans." [3], vi., 281), by same method, found in Assam 33 per cent. and 45.5 per cent.; in Young Hyson 39 per cent. and another 39 per cent.; in mixed Caper 42.3 per cent. The Young Hyson giving 45.5 per cent. was a mixture of six samples. Dragen-dorff ("Werthbestimmung," 1874, p. 60) quotes green tea at 12.32 and 12.70 per cent. of tannic and boheic acids, and a sample of black tea 9.42 per cent. Mr. Allen and Mr. Wanklyn take the average of tannin in black tea at 10 per cent. for a basis of calculation of presence and proportion of spent tea.

The *total ash* was obtained by the incineration of one gram of tea in a weighed crucible. For the *soluble ash*, the total ash was washed on a filter with hot water till the washings gave no residue, the residual ash dried and weighed, and the difference of weight taken.

The samples were obtained from the retail trade in Michigan.

No.	Name.	Price per pound.	Portion soluble in water.	Tannin.	Total Ash.	Ash soluble in water.
1	Japan,	\$0.65	36.5	19.	5.6	2.4
2	Young Hyson,	0.80	39.8	12.4	5.0	2.4
3	Japan,	0.90	41.8	9.5	6.3	3.9
4	Black,	0.90	44.5	10.6	5.5	
5	Young Hyson,	0.75	37.2	16.	6.7	
6	" "	1.00	45.0	20.1	7.1	3.5
7	" "	0.85	44.9	17.5	5.7	
8	Japan,	0.90	35.7	14.6	6.1	
9	Oolong,	0.40	29.4	8.0	6.7	1.7
10	English Breakfast,	1.00	21.2	5.6	5.2	1.3
11	Japan Sittings,	0.50	39.7	10.1	7.6	
12	Japan,	0.40	23.4	7.6	4.8	0.9
13	Young Hyson,	0.40	36.9	12.3	6.7	
14	"Am. Tea Co."		41.5	16.7	5.6	
15	Oolong,		39.6	8.9	6.4	

The results in Nos. 10 and 12 indicate *spent tea*. By Allen's formula, the per cent. tannin indicates 55 per cent. of spent tea in No. 10, and 30 per cent. in No. 12. By Wanklyn's formula, the amount of soluble extract indicates 36 per cent. of spent tea in No. 10, and 28 per cent. in No. 12. The infusion of No. 10 had a very disagreeable odor. The low per centages of soluble ash in Nos. 10 and 12 also correspond with those of spent tea.

The fifteen samples were subjected to microscopic examination for *foreign leaves*. In No. 9, a considerable number of foreign leaves were found. These foreign leaves had an epidermis composed of small tabular cells; stomates mostly on the under side; the interior composed of an incomplete parenchyma of round cells and numerous intercellular passages.—*Amer. Chemist*, August, 1876.

NOTE ON THE GUNS OF SENEGAL.¹

BY DR. A. CORRE.

In commerce the gums of Senegal are distinguished according to the district which yields them or the port from which they are exported.² They are (1) *Gommes-bas-du-fleuve* (Bas-du-fleuve, Degana and Podor ;

¹ "Journal de Pharmacie" [4], vol. xxiv, p. 318.

² These gums are not very often met with in general commerce, the greater part of them being imported into and used in France.—ED. "Ph. J."

gums from the desert of Bounoun and the country of the Braknas); and (2) *Galam gums*, or *Gommes haut-du-fleuve* (Galam, Podor, Bakel and Medina). These gums, when carefully sorted, yield very different products, which the author classifies as follows :

A first group includes the gums in round pieces (*en boules*, so-called because of their form). The subdivisions of this group are regulated by the degree of consistence and resistance, size and color of the balls.

A. Hard gums (*Gommes dures*), of firm consistence, with large, clear, shining fracture:—(1) *grosse blanche*: pieces large or medium sized, entire, white or yellowish-white; (2) *petite blanche*: pieces small, entire or in fragments, generally whiter than the preceding; (3) *grosse blonde*: pieces large or medium sized, entire, yellowish or reddish yellow; (4) *petite blonde*: pieces small, entire or in fragments, yellowish or reddish-yellow; (5) *deuxième blonde*: pieces more or less large, entire, or in fragments, reddish; (6) *fabrique*: pieces more or less large, entire or in fragments, reddish or brownish, moderately limpid, grumous or tear-like on the surface, with a fracture often resinoid, uneven and dull.

B. Soft or friable gums (*Gommes molles ou friables*): (7) *blanche*, (8) *blonde*, (9) *fabrique*.

In a second group the author places the gums occurring in elongated masses, a form which results doubtless through delay in the solidification of the gum upon the tree, caused by rains or humidity of the atmosphere: (10) *larmeuse*: in mammillated or undulated masses, clear light yellow color, shining at the surface, fracture clean, hard; (11) *vermicelle*: rather dull white, surface corrugated, fracture pretty clean and shining, friable; this gum is remarkable for its convolute form, which resembles that of vermicelli.

To a third group belong the gums in fragments and powder, the *débris* and residue of the preceding: (12) *gros grabeaux*; (13) *moyens grabeaux*; (14) *menus grabeaux*; (15) *grabeaux triés*; (16) *grabeaux fabrique*; (17) *poussière*.

To a fourth group is allotted (18) *marrons* or *bois*, a largish gum, frequently of resinoid aspect, yellowish or brownish, mixed with, or adherent to, fragments of bark.

The Senegal gums are collected from a great variety of plants. The acacias (*Acacia nilotica*, *Verek*, *Adansonii*, *albida*, *dealbata*, *Sing*, *Seyal*, etc.) yield the greater part and the finest qualities. They are also obtained from the *Khaya senegalensis*, certain *Spondias*, some *Sterculiaceæ*, and perhaps *Bassia*, etc.

As the result of the study of the mode in which the gum is produced from the *verek*, the author is of opinion that the starting point is certainly in the cambium. When a transverse incision is made in a young branch, there is observed at first a sort of exudation, badly defined, between the wood and the bark. As the exudation becomes more considerable it raises the bark, and makes its way to the exterior through any cracks or fissures. But as there are two layers in this zone—a ligneous and a cellular layer—the question arises, In which layer does the gum take its origin? For the following reasons the author believes it to be formed in the ligneous layer, at the expense of the crude sap circulating therein.

(1) Upon different specimens of *verek* he has observed that at the level of the base of the gummy exudations the exterior woody bundles become deviated in the form of a capsule, and present traces of an erosive or destructive action. In very young branches, by the aid of a microscope, these bundles may be distinguished, dissociated and jagged, in the midst of the gummy matter.

(2) The balls of gum are frequently marked with very regular cavities, similar to those produced in a viscous mass by blowing air into it through a slender tube. These cavities cannot be due to the penetration of a gas coming directly from without, for they face inwards, *i. e.*, towards the base of the exudations; they could only be produced by the air from the vessels of the sap wood, ruptured and dissociated at the same time as the woody fibres.

(3) The mineral elements of gum (lime, etc.) belong to the crude sap.

Gum, however, is not simply water charged with salts, neither is it a highly concentrated saline solution. It is a product that presents great analogy of chemical composition with lignose. The author, therefore, considers gum to be the result of a kind of liquefaction of the elements of the sap wood by the crude sap.

It is incontestable that the formation of gum is connected with an anomalous state, due to excess of nutrition. It is observed more particularly at the points of budding and at the bifurcation of the branches, and it acquires a remarkable development upon abnormal nodosities—in fact wherever the nutritive action exists in the greatest intensity. Beyond certain limits, this energy in the rising of the sap is accompanied by a slackening of the circulation, which leads to a stagnation

of the liquid through the engorgement of the channels; hence, perhaps, by absorption, leading to the softening and liquefaction of the fibrous and vascular element of the sap wood.

In this phenomenon the easterly winds have a share, their high temperature and dryness favoring the determination of the sap to the exterior. Their influence is not, as often stated, limited to the production of cracks in the bark. It will be seen that there is a great analogy between the mode of the formation of a verec gum and that of the gum of Rosaceae, as described by Trécul.

Recently an important part in the production of the Senegal gums has been attributed to a loranthaceous parasite, which is met with frequently in Eastern Africa, not only on gum trees, but also on guava trees, palms, etc. The author has never observed the least exudation of gum at the points of implantation of this parasite, which itself takes up sap, and leaves no excess for the plant on which it is developed. The nodosities, which have probably been attributed to the action of this parasite and thus led to the suggestion, the author considers to be the results of insect punctures.—*Pharm. Journ. and Trans.*, Oct. 21, 1876.

VARIETIES.

ETCHING ON GLASS.—By E. Siegwart.—Since hydrofluoric acid can be sold cheaply, it seems to be more and more used for the decoration of glass. This can be easily understood, as glass articles, when sufficiently etched, will have a much better appearance than engravings on glass. The best decorations are obtained by etching several portions of the glass surface with ammonium fluoride slightly acidified with acetic acid. If plates of glass are to have an ice-like lustre, the glass is, in the first place, covered with a layer of very small shot, over which very dilute hydrofluoric acid is then poured. Results similar to etched photographs are obtained by exposing any negative picture on a layer of gum or caoutchouc-layer rendered sensitive by potassium bichromate, and then dusting it with red lead. The red negative thus obtained is fixed as usual, and burnt in, and the more soluble lead glass thus obtained is treated with concentrated nitric acid, whereby a dull white picture is produced, appearing positive when looked through.—*Jour. Chem. Society* [Lond.], from *Dingl. polyt. J.*, CCXX, 479-480.

ON THE PREPARATION OF SOME COLORED FIRES (BENGAL LIGHTS) USED IN PYROTECHNY.—By Sergius Kern, St. Petersburg.—In preparing colored fires for fireworks by means of the usual formulæ given in many manuals of pyrotechny it is often very necessary to know the quickness of burning of colored fires, so as in

some cases, as decorations and lances, they must burn slowly, in other cases, as wheels, stars or rockets and Roman candles, they must burn quicker. Working for some months with many compositions of such kind, I prepared three tables of colored fires (red, green and violet), where every formula with a higher number burns quicker than a fire with a lower number. For instance, No. 5 burns quicker than No. 6 and slower than No. 4. These tables will, I think, be of much assistance in the preparation of fireworks.

Green-colored Fires.

No.	Potassium Chlorate. Per cent.	Barium Nitrate. Per cent.	Sulphur. Per cent.
1.	36	40	24
2.	29	48	23
3.	24	53	23
4.	21	57	22
5.	18	60	22
6.	16	62	22
7.	14	64	22
8.	13	66	21
9.	12	67	21
10.	11	68	21
11.	10	69	21
12.	9.5	69.5	21
13.	9	70	21
14.	8.5	70.5	21
15.	8	71	21

Red-colored Fires.

No.	Potassium Chlorate. Per cent.	Strontium Nitrate. Per cent.	Sulphur PerCent.	Carbon Powder. Per Cent.
1.	40	39	18	3
2.	32	46	19	2
3.	27	51	20	2
4.	23	55	20	2
5.	20	58	20.5	1.5
6.	18	60	21	1
7.	16	61.6	21.2	1.2
8.	15	63	21	1
9.	13	64	22	1
10.	12	65	22	1
11.	11	66	22	1
12.	10	67	22	1
13.	10	67.25	22	0.75
14.	9.25	68	22	0.75
15.	9	68.35	22	0.65

Violet-colored Fires.

No.	Potassium Chlorate. Per cent.	Calcium Carbonate. Per cent.	Malachite, powdered. Per cent.	Sulphur. Per cent.
1.	52	29	4	15
2.	52	28	5	15
3.	52	26	7	15
4.	52	24	9	15
5.	52	23	10	15
6.	52	21	13	15
7.	51	20	14	15
8.	51	18	16	15

Violet-colored Fires.

No.	Potassium Chlorate. Per cent.	Calcium Carbonate. Per cent.	Malachite, powdered. Per cent.	Sulphur. Per cent.
9.	51	16	18	15
10.	51	15	19	15
11.	51	13	21	15
12.	51	11	23	15
13.	51	10	24	15
14.	51	8	26	15
15.	51	6	28	15

—*Chem. News*, Sept. 29, 1876.

THE PHYSICAL PROPERTIES OF GALLIUM.—M. Lecoq de Boisbaudran, in a recent note to the French Academy of Science, states that he has prepared about 7½ grains of gallium. In liquid state, the metal is a beautiful silvery white; but in crystallizing it turns blue, and its brilliancy becomes greatly diminished. The point of fusion is fixed, for the metal melts very slowly at 86.27° Fah., and crystal-

lizes very slowly at $86^{\circ}09'$. The density of the specimen is 5.935. Gallium crystallized under water crepitates sometimes on heating.—*Scient. Amer.*, November 11, 1876.

CHEMICAL REACTIONS OF GALLIUM.—By M. Lecoq de Boisbaudran.—Solutions of *pure* gallium, mixed with acid acetate of ammonia, are not rendered turbid by sulphuretted hydrogen, but if zinc is present the sulphide of this metal is charged with gallium, but the liquid is not entirely freed from it. If the salts of zinc are not plentiful enough to draw down at once all the gallium precipitable by sulphuretted hydrogen, it must be added in small portions until these products no longer give the ray $Ga\ a\ 417^{\circ}0$ in the spectroscope. Only slight traces of gallium remain then in the liquid. On proceeding thus, the amount in the precipitates appears to remain at first almost constant, or at least to decrease slowly, and then more and more rapidly: it does not, therefore, seem to be a function of the amount of gallium in the liquid. Is there not here an indication of a combination between the two substances, or perhaps more probably a surface-attraction analogous to the fixation of a coloring matter upon a mordant. It is known that salts of zinc slightly acid are precipitated by sulphuretted hydrogen, the action being limited by the quantity of strong acid set at liberty. If the experiment is made with a chloride of zinc containing gallium, a notable quantity of this metal falls along with the sulphide of zinc. An ammoniacal solution of the salts of gallium and zinc is precipitated by hydrosulphate of ammonia. An excess of the reagent does not remove the gallium, unless, indeed, the sulphide of zinc is in such small quantity as to dissolve also. The case is different when the salt of gallium is pure. The ammoniacal solution is not rendered turbid by the sulphide of ammonium. If a neutral or slightly acid solution of the chlorides of zinc and gallium is submitted to fractionated precipitation with sulphide of ammonium containing free ammonia, the gallium is concentrated in the first products. If an ammoniacal solution of zinc and gallium is submitted to the same treatment, the gallium, on the contrary, accumulates in the last precipitates.—*Chem. News*, October 27, 1876.

CONTRIBUTIONS TO THE THEORY OF LUMINOUS FLAMES.—By Dr. Karl Heumann.—In this part of his treatise the author arrives at important results, both theoretical and practical. He shows that the carbon in the flame exists as a solid body, and not, as Frankland assumes, in the state of vapor. He finds that gas-jets of steatite are decidedly preferable to those of iron, since they consume less gas for an equal strength of light. Metallic jets, in general, notably enfeeble the light. He refers to the result obtained by the Commission of the English Board of Trade who reported, in opposition to the view of Vogel, that a refrigeration of the gas does not decrease the amount of light, and considers that they must have experimented with a kind of gas poor in hydrocarbons capable of condensation. On the contrary, he finds that if the jet and the outflowing current of gas are both strongly heated the luminous effect is increased to an extraordinary degree.—*Chem. News*, Nov. 10, 1876.

CHLORIDE OF LEAD DISINFECTANT.—The London *Lancet* directs attention to the value of chloride of lead as a deodorizer. The manner of its use is to dissolve half a drachm of the nitrate in a pint of boiling water, and pour this solution into a bucket of water in which two drachms of sodic chloride (common salt) have been dissolved. After chemical action has taken place, the clear supernatant liquid is an odorless saturated solution of chloride of lead. If this solution be thrown into a sink or vault from time to time, the disagreeable odors will soon be destroyed. A ship's bilge was completely disinfected in this way by simply dissolving half an ounce of nitrate of lead in boiling water, and pouring it into the bilge water, which itself supplied the necessary sodic chloride. Cloths wet with this solution, and hung in fever and accident wards of hospitals, are said to keep the atmosphere sweet and healthy.—*Scient. Amer.*, December 2, 1876.

TO DISTINGUISH BETWEEN COTTON AND WOOL IN FABRICS.—Ravel out the suspected cotton fibre from the wool and apply flame. The cotton will burn with a flash, the wool will curl up, carbonize and emit a burnt, disagreeable smell. Even to the naked eye the cotton is noticeably different from the filaments of wool, and under the magnifier this difference comes out strongly. The cotton is a flattened, more or less twisted band, having a very striking resemblance to hair, which, in reality, it is; since, in the condition of elongated cells, it lines the inner surface of the pod. The wool may be recognized at once by the zigzag transverse markings on its fibres. The surface of the wool is covered with these furrowed and twisted fine cross lines, of which there are 2,000 to 4,000 in an inch. On this structure depends its felting property. Finally, a simple and very striking chemical test may be applied. The mixed goods are unraveled, a little of the cotton fibre put into one dish and the woolen in another, and a drop of strong nitric acid added. The cotton will be little or not at all affected; the wool, on the contrary, will be changed to a bright yellow. The color is due to the development of a picrate.—*Scient. Amer.*, December 2, 1876.

DISTINCTIVE REACTION BETWEEN REDS FROM ARTIFICIAL ALIZARIN AND THOSE FROM EXTRACT OF Madder.—By M. J. Wagner.—The author finds that extract reds are very much injured by a mixture of soda and potassic ferricyanide, whilst artificial alizarin-reds are scarcely affected. This difference is doubtless due to the presence of purpurin in the extract which is destroyed by this reaction.—*Chem. News*, Oct. 27, 1876, from *Bulletin de Mulhouse*.

ENGLISH DEALINGS WITH FOOD ADULTERATIONS.—If there is any one subject on which the British public is extremely sensitive, it is the quality and purity of its food and drink. No country, we believe, has such stringent legislative enactments against adulterations; and the legal formalities for their enforcement are made so few and simple that the aggrieved consumers now waste no time in vain denunciations, but summon the offending grocer or butterman forthwith before the nearest magistrate to answer for the fraud.

An excellent instance, showing how persistently warfare against spurious materials is waged, is found in attacks now being made in England on artificial butter. It is a well-known fact that, until recently, attempts to produce even a moderately palatable artificial butter have failed; and although the product has been made of fair savor while fresh, a day or two's keeping has turned it into mere tallow. In England, however, the fraud has not ended at this. Conscienceless individuals have sold as butter, it is said, horrible concoctions of old lubricating tallow, and even old tallow candles *minus* the wicks, which an official analyst describes as "supplied to the poor in the last stages of rottenness." One factory was detected making this delectable product at the rate of two tons a day. This and many other like cases being well known, it is but natural that the British public should cordially detest "grease butter." The *London Grocer* has lately printed long reports of trials of sellers of the adulterated material; and to show how rigidly the penalties against the adulterations are enforced, we note that a retailer who purchased grease butter, innocently supposing it to be genuine cream butter, and who sold it to a customer as the latter, was nevertheless fined \$50, and further proceedings were ordered to be taken against the wholesale merchant from whom he obtained his supply.

We have frequently remarked this same severe dealing in England with every other species of food fraud. At the same time, no one need remain in ignorance as to what constitutes fraud, because the parliamentary reports on the subject, even in respect to tobacco and other unnecessary luxuries not classified as food, contain reliable and full information relating thereto. The whole matter is a suggestive one for us in this country. Here the prosecution of a retailer by a private citizen, because of the former selling $\frac{3}{4}$ lb. of grease for 1 lb. genuine butter, as in the above cited instance, would be considered extraordinary. Our main reliance for protection is in the vigilance of health boards, whose jurisdiction is local and limited in authority. Hence, in most cities, we may look in vain for either frequent prosecutions or reports of adulterations prepared under official auspices, although the possibility of such reports being compiled is plainly indicated by the admirable yearly work of the Massachusetts State Board of Health. Reports, however, can merely warn us of evils in the shape of food adulterations, under which we shall probably continue to suffer until penalties are enforced, as rigidly here as they are in England, against each and every retailer who wittingly or unwittingly sells a spurious article.—*Scient. Amer.*, December 2, 1876.

VARNISH FOR SILVERWARE.—Gum elemi, 30 parts; white amber, 45; charcoal, 30; spirits of turpentine, 375. It must be used in a heated state, the metal to which it is to be applied being also heated.—*Scient. Amer.*, Nov. 11, 1876.

MINUTES OF THE PHARMACEUTICAL MEETING.

THE second meeting of the Session was held November 21st, 1876, Dillwyn Parrish, President, in the chair. The minutes of the previous meeting were read and approved.

Dr. W. W. Lamb was introduced, and the chairman stated it gave him pleasure to see the room so well filled with members in attendance.

The following donations to the library were announced by Prof. Maisch, and upon motion of C. L. Eberle, the thanks of the College were returned to the donors. From Prof. Alfonso Herrera, Mexico: *Nueva Farmacopea Mexicana de la Sociedad Farmacéutica de México*, 1874; *Aguas potables de México*, 1869; also some numbers of *Gaceta Médica de México*. From Mr. W. Thiese: *Trommsdorff's Pharmaceutische Waarenkunde*, 1806; *Dulk's Pharmacopœa Borussica*, 1829; *Geiger's Handbuch der Pharmacie*, 1833; *The Botanico-Medical Recorder*, 1840.

R. V. Mattison read a paper on Extract of Malt (see page 531), and exhibited a sample of the product and also an emulsion of cod-liver oil and extract of malt containing 50 per cent. of oil, its odor disguised with almond and wintergreen. It is readily prepared, no gum or other emulsifier being required. It readily mixes with water, but separates the oil as a creamy layer upon standing, and upon again shaking the mixture is restored.

A. P. Brown stated the same facts were true where an infusion of malt was used in this manner—the oil being emulsified by simply agitating it with the infusion.

Prof. Remington exhibited specimens of Russian Isinglass obtained from the Russian Commissioners. They comprise various kinds of sturgeon, carp and silure isinglass from astrachan, consisting of leaves in various thicknesses, circular pieces and long cords tied together; also, so-called "crumbs."

Prof. Maisch exhibited Dugong Oil, also pure Gelatin in sheets, made in Hanau, Germany, by Otto Lindenauber, and a sample-card of colored Gelatin made by Carl Spatz. The raw material used is the residues from the bone-button works. The gelatin is of the finest quality—the samples exhibited, in addition to the white, were of many beautiful colors.

At our next meeting it is expected the Committee on Cabinet will be prepared to show many interesting specimens.

On motion, adjourned, to meet December 19th, 1876.

WILLIAM MCINTYRE, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.—The second social and conversational meeting was held in the College Hall, November 2d, 1876, at 3½ P. M. Thirty-four members present.

Among the subjects of interest presented was oil of Ceylon cinnamon *leaves*, which Dr. Miller stated was much lower in price and very pleasant in odor, though differing from the oil of the bark in its resemblance to cloves. This resemblance, suggesting the presence of eugenic acid, Mr. N. A. Kuhn volunteered to ascertain by the appropriate tests.

Oil of Florida cedar was shown by Dr. Miller, who had had it offered him as an excellent adulterant for oil of sandal wood, which it resembled in odor.

Mr. Boring stated that tincture of columba could be made perfectly clear by percolating the root without previous moistening.

The use of paraffin in the process of enfleurage, as practised in the French flower farming districts, was alluded to, and in connection with it French oil of rose, as exhibited at the Centennial, the first made in that country, worth twenty-five dollars an ounce in gold.

Mr. McIntyre stated that Irish dulse was used largely for food in his neighborhood, being esteemed alterative in its effect. It consists of two species of algæ, which are common on the coasts of Ireland and Scotland, namely: *Halymenia* (s. *Fucus*, s. *Rhodomela*), *edulis* and *palmata*, Agardh.

President Kennedy gave the outlines for a process for making diluted hydrocyanic acid, in which the concentrated acid is made as usual, but stronger alcohol used as the diluent. This, he stated, seemed to keep perfectly unchanged.

A discussion ensued on the means of preservation of ointments, after which the meeting adjourned.

WALLACE PROCTER, *Secretary*.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—At the pharmaceutical meeting held November 1st, President John Williams in the chair, Prof. Archer made a few general remarks about the chemical and pharmaceutical sections of the Centennial Exhibition, and gave an account of the exercises at the commencement of the Philadelphia College of Pharmacy, at which he had been present.

Mr. Thos. Greenish read a paper containing suggestions for an improved method of making *mistura guaiaci* and similar mixtures. In endeavoring to dispense an emulsion of copaiba resin, the author had met with unexpected difficulties, which he overcame by triturating the resin with some milk-sugar, then adding alcohol, and afterwards gum arabic in place of the mucilage ordered, the mixture being finished by the requisite amount of water; the quantities were as follows: *Res. Copaibæ* ℥iss; *Sacch. lactis* ℥iii; *Alcohol* ℥iii; *Pulv. Acaciæ* ℥v; *Aquæ* ad ℥vi. m. This suggested a slight alteration in the officinal guaiacum mixture, which the author proposes to make in a similar manner, by using powdered guaiacum, sugar of milk and gum arabic, of each half an ounce; rectified spirit 5 fluid drachms and cinnamon water sufficient to make one pint (imperial).

A question by Mr. Gerrard, as to whether copaiba resin was not frequently contaminated with copper, led to several statements that the resin attacked copper and lead, and should, therefore, not be prepared in metallic stills; moreover, it should not have a green color. In the discussion the purity of different varieties of guaiacum resin, and the cause and nature of the change of its color to green were referred to; also the necessity of extended researches on emulsions, natural as well as artificial, and the changes occurring during and after mixture with certain liquids.

Mr. Martindale exhibited several varieties of spread plasters, prepared by an American firm, and alluded to their very adhesive basis and great flexibility. Great

superiority of india rubber was claimed by Mr. Gerrard over gutta percha for this purpose.

Mr. Holmes exhibited a specimen of a more translucent benzoin, which yielded, by sublimation, beautifully white benzoic acid, and was said to come from Zanzibar; it was considered, by Prof. Bentley, to resemble most nearly Pereira's translucent Siamese benzoin, which Dr. Royle conjectured to be derived from *Styrax Finlaysonianum*. The great peculiarity of the specimen exhibited was the translucency of the white tears, which are generally opaque.

A specimen of *olibanum*, with some of the papery bark adhering, was also exhibited. It was the variety called by the natives, *Lubán matti*, was derived from *Borwellia Frereana*, Birdw., and distinguished from other varieties by a peculiar whitish efflorescence on the surface and stratified opaque layers in its interior.

Professor Bentley called attention to the blue fluorescence shown by water in which galbanum had been macerated for an hour or two, and to which a drop of ammonia was then added. Asafetida would cause a similar fluorescence, but not to the same extent; and with ammoniacum it was scarcely observable. The fluorescence is due to the presence of umbelliferon in the gum resins.

PHARMACEUTICAL SOCIETY OF PARIS.—At the meeting held October 4th, the death of Mr. Gobley was announced (see page 576).

Dr. Jaillard exhibited a sample of adulterated *sulphate of quinia* which had recently been sent to Algiers, the adulteration consisting of about 70 per cent. of potassium nitrate. It is not observable to the eye, but on heating a portion, deflagration takes place and a white ash is left.

Mr. Yvon reported on researches on *Xanthium spinosum* (see page 538), and stated experiments made with the view of determining its alleged prophylactic action in hydrophobia, had given decidedly negative results.

THE GENERAL BELGIAN PHARMACEUTICAL ASSOCIATION has remonstrated with the government against the granting of pharmaceutical degrees by universities at which no pharmacists are acting either as professors or examiners, and has, at the same time, petitioned for the establishment of a pharmaceutical school, which, like in other countries, should be under the control of pharmacists.

SWISS APOTHECARIES' ASSOCIATION.—The Thirty-second Annual Meeting was held at Neuchâtel, August 24th and 25th, Prof. E. Schaer, President, in the chair. Besides the interesting address of the President, the usual routine business and the consideration of some local affairs, the following subjects claimed the attention of the meeting: Assaying of milk by various methods; a new apparatus for sealing wafer capsules, patented by Digne, of Marseille; Leube's *Creosozon*, the mineral water of Noivaigne, and a number of new and rare drugs, exhibited by Prof. Schaer. The so-called creosozon is a mixture of from 1 to 3 parts of sulphuric acid with 100 of water, and has been recommended for the preservation of animal

substances, such as meat, etc. Perrenoud explains its preservative action by the neutralization of the organic bases which are formed on the putrefaction of animal matter, and by the prevention of such a change.

THE APOTHECARIES' SOCIETY OF BERLIN, at its session, held October 24th, listened to a discourse by Mr. Holtz, on the Centennial Exposition at Philadelphia.

Dr. Schacht proposed as basis for *bougies* and *suppositories* a mass consisting of 10 parts glycerin, 25 water and 6 gelatin.

A curious substitution for *black pepper* was shown, introduced in consequence of its high price; it consisted of cubebs which had been completely deprived of their stalks.

EDITORIAL DEPARTMENT.

THE JOURNAL closes with the present number its forty-eighth volume. During the year which is about to close, as in former years, it has been a welcome visitor to many pharmacists at home and abroad, and we trust will hereafter not only continue to number them amongst its readers, but will likewise make many new friends. Our friend and colleague, the Business Editor, reminds us, however, that the publication of the JOURNAL requires monthly a considerable outlay, and that a number of our readers have—perhaps in the pressure of business—omitted to make the usual annual returns. We are sure that it needs only this gentle hint to recall the unpaid bills to their minds and to remit promptly the arrears not only, but likewise, if the money can be spared before the holidays—and we imagine the JOURNAL to be a very good holiday present—the subscription price for the ensuing volume. Most of our readers, we are glad to say, bear in mind our mutual obligations; the few who have overlooked one side of the question, will doubtless follow their example.

Our readers are aware that the pages of the JOURNAL are open for the discussion of all subjects having a pharmaceutical interest, and we bespeak for the next volume as many original communications as we had the pleasure to receive before.

It should be stated yet that for the essays published on pages 544 to 549 we are indebted to the *Pharmaceutical Journal and Transactions* (London), September 30th.

SWEET GUM.—On page 335 of the July number we gave some information obtained from Mr. L. Hughes, Dyersburg, Tenn., of some of the uses to which this exudation of *Liquidambar styraciflua* is put. In another communication the same correspondent states that he has employed its solution in ether, in which it dissolved rapidly and entirely, for the purpose of *cutting* the mercury in preparing mercurial ointment. Mixed with a little fixed oil of almonds it acted admirably, the mercury being extinguished in a short time. Our correspondent remarks that, in his opinion, the "sweet gum" would answer all the purposes of the more expensive tolu balsam, and that it can be obtained for about \$1 per pound.

OPIUM ANTIDOTES.—On page 464 of this journal for 1873, will be found the analysis of a "cure for the habitual use of opium," manufactured in Cincinnati, and containing a considerable amount of morphia. Similar preparations are made elsewhere, as will be seen from the annexed report made to the Cumberland Medical Society, Ind., which we copy from the "Boston Med. and Surg. Jour." for Oct. 26; we desire to direct the especial attention of our readers to it so that they may use their influence to expose this and similar frauds.

The committee to whom was assigned the duty of investigating the so-called "opium antidote" prepared by Mrs. J. A. Drollinger, of La Porte, Indiana, beg leave to report that a sample bottle of the article, which was obtained directly from the manufacturer, was sent to Dr. Edward R. Squibb, of Brooklyn, N. Y., for quantitative analysis. His onerous engagements rendered it impossible for him to conduct the investigation in person, but he sent the specimen to Messrs. Walz and Stillwell, chemists, New York, a firm which he thoroughly confides in and indorses. So deeply interested did he become in the project that he insisted upon bearing the expenses of the analysis, in spite of the committee's expressed unwillingness to have him assume such a tax.

Walz and Stillwell report that "this sample is glycerin colored with anilin red, and containing in solution crystallized sulphate of morphia 1.383 per cent. by weight"—about seven grains to the ounce.

While this investigation was progressing, the committee found another alleged "opium antidote," prepared by "Dr. S. B. Collins, the Great Narcologist of the Age," likewise of La Porte, Indiana. A specimen of this was submitted to Dr. Henry Carmichael, Professor of Chemistry in Bowdoin College and Assayer of the State of Maine, who arrived at the following conclusions:—

"(1.) The opium antidote contains morphia.

"(2.) The morphia is combined with sulphuric acid.

"(3.) The sulphate of morphia amounts to 3½ per cent., or fourteen grains to the ounce."

Dr. Walz says that he made an analysis of Collins's "antidote" in 1871, and found that it contained morphia, though he did not ascertain the quantity.

In conclusion, your committee respectfully suggests that the society take some action which will result in the wide dissemination of the information which has been acquired concerning these dangerous preparations.

FREDERICK HENRY GERRISH, }
GEORGE F. FRENCH, } Committee.
THOMAS A. FOSTER, }

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

A systematic Handbook of Volumetric Analysis, or the quantitative estimation of chemical substances by measure, applied to liquids, solids and gases. Adapted to the requirements of pure chemical research, pathological chemistry, pharmacy, metallurgy, manufacturing chemistry, photography, etc., and for the valuation of substances used in commerce, agriculture and the arts. By Francis Sutton, F.C.S., etc. Third edition. Philadelphia: Lindsay & Blakiston. 1876. 8vo, pp. 430. Cloth, price \$5.50.

The author first gives a table of the commonly-occurring elements with their symbols and atomic weights, and gives then a concise explanation of the technical terms employed in volumetric analysis, such as *normal solution*, *titration*, etc. Part I is devoted to the general principles upon which this method of quantitative analysis is based, the description of the instruments and apparatus, the preparation of the solutions and the explanation of the direct and indirect processes of analysis.

Part II describes the analysis by saturation or neutralization, embracing the vari-

ous methods of estimating free and combined acids, alkalies and alkaline earths.

Part III treats of the methods of analysis based upon reduction or oxidation by hyposulphite of sodium, arsenious acid, iodine, permanganic and chromic acids.

Part IV is devoted to the analysis by precipitation with and without the use of an indicator.

The general descriptions of the different methods of volumetric assay is then followed in Part V by the application of these principles to the analysis of special substances, to the determination of which they have been ascertained to be applicable; and, in Part VI, by the special application to the complete quantitative analysis of wine, soils, manures, natural waters and sewage.

Part VII, which has been contributed by Prof. McLeod, treats of the volumetric analysis of gases, describing the necessary apparatus and methods to be followed. The Appendix contains a few additional processes for the estimation of nitrites and three or four metals, and several tables for corrections for temperatures in the analysis of gases.

The work being intended for those who are sufficiently advanced in chemistry, its pages are not filled with minute descriptions of elementary manipulations; but the descriptions of the processes and manipulations are characterized by keeping an acceptable middle between the former and inconvenient conciseness. They are clear, and enter, particularly in the special applications, sufficiently into detail to avoid misconception, and, wherever necessary, excellent cuts facilitate exactness of understanding. We regard the work as very well adapted to the purposes for which it was written, but must remark that the pharmaceutical requirements are limited to the estimation of inorganic elements, some organic acids, tannin and sugar, the estimation of alkaloids, for instance, not being embraced in the scope of the volume.

Illustrations, typography and paper leave nothing to desire; and if we add that the proof-sheets have been evidently read with great care, and that a good index has been prepared, it will be seen that the book can be consulted and used with profit and dispatch.

Medicinal Plants, being descriptions with original figures of the principal plants employed in medicine, and an account of their properties and uses. By Robert Bentley, F.L.S., and Henry Trimen, M.B., F.L.S. Philadelphia: Lindsay & Blakiston. Parts 6, 7, 8. Price, \$2.00 each.

The parts of this excellent work now before us contain plates with the usual descriptions of *Anamirta paniculata*, *Canella alba*, *Barosma betulina* and *serratifolia*, *Physostigma venenosum*, *Pterocarpus marsupium* and *santalinus*, *Hemidesmus indicus*, *Illicium anisatum*, *Polygala Senega*, *Camellia Thea*, *Melaleuca minor*, *Uncaria Gambir*, *Chimaphila corymbosa*, *Ophelia Chirata*, *Schoenocaulon officinale* (*Sabadilla*), *Althæa officinalis*, *Balsamodendron Opobalsamum*, *Exogonium purga*, *Nicotiana Tabacum*, *Ricinus communis*, *Pinus Larix* and *Canna edulis*.

Dissertation sur les Caractères spécifiques du Genre Colchicum et sur quelques espèces nouvellement découvertes en Grèce. Par Theo. G. Orphanides, Professeur à l'université d'Athènes. Florence, 1875. 8vo, pp. 11.

Dissertation on the specific characters of the genus Colchicum and on several species recently discovered in Greece.

The author enumerates 43 species of colchicum, three of which, contained in the herbarium of the Museum of Florence, are as yet undetermined. Of the four species recently discovered by him in Greece, one, which he names *Colch. Boissieri*, has a horizontal rhizome, similar to *Anemone nemorosa*; the three other species are *C. eubæum*, *C. Parlatoris* and *C. polymorphum*, the latter being allied to *C. neapolitanum*, Tenore, and may perhaps be a variety of it. The author directs special attention to the very variable characters of the leaves and the different parts of the flowers in most of the species, considerable variations being frequently met with in the same plant. Five of the species enumerated belong to Africa, 21 are found in Europe and Asia, 7 are indigenous to Greece and other parts of Europe and 10 are characteristic of Greece.

Recherches expérimentales sur le rôle physiologique et thérapeutique de la Pancréatine.

Par Th. Defresne, pharmacien, etc. Paris: A. Delahaye, 1875. 12mo, pp. 102.

Experimental researches on the physiological and therapeutical action of pancreatin.

After a brief review of the literature on the pancreatic juice, the author states that in its dried state it is usually called pancreatin; he has succeeded to preserve the juice, which is otherwise readily altered, for over three weeks, by mixing it with half its volume of ether. This preservative property of ether has been utilized for the preparation of pancreatin as follows: Fresh pancreas, after being bruised, are introduced into a suitable vessel together with ether, and kept at a temperature of 45°C. for 24 hours, when the glands will be completely disintegrated, the fibrous tissue floating upon the surface. The ethereal juice is now rapidly evaporated in a current of air at a temperature of 40°C., and the residue powdered.

Thus obtained, pancreatin forms a pale-yellow powder, which is very soluble in water, forming a viscous solution of an animal flavor and coagulating by heat, like albumen. Alcohol precipitates from the solution the pancreatic ferment, while the liquid portion is inert. Pancreatin is destroyed by heat at about 70°C., also by strong acids and alkalies; tannin, as well as metallic salts, give insoluble precipitates with it; very dilute acids and alkalies do not disturb the solution, and the salts of the alkalies neither alter the pancreatin nor lessen its action.

The author then considers the action of pancreatin upon the nitrogenized aliments, starch, fats and mixed food, and finally its medicinal uses. It may be given in soup, a little bread or some sweetened water, in doses of 0.50 to 0.75 grams (7 to 12 grains); or in pills prepared from 4 grams pancreatin, 0.50 honey and sufficient of an inert powder to make 20 pills, three to five of which may be taken just before meals. The *pancreatic elixir* should not contain over 8 per cent. of alcohol, and if necessary the wine should be completely freed from tannin by egg albumen. It is made of 4 grams pancreatin, 120 white wine, 175 crystallized sugar and 10 tincture of coffee; dose, a tablespoonful, containing 0.25 gram. (4 grs.) pancreatin. *Pancreatic emulsion of codliver oil* (or other oil) is made by digesting at a moderate heat for 24 hours 1,000 grams codliver oil, 40 powdered pancreatin and 300 simple syrup. It is now perfectly miscible with water (cherry laurel or other aromatic water may be used for diluting it), and may be given in chocolate, milk, coffee or broth to suit the taste.

The pamphlet concludes with a number of reports from hospitals, in which these preparations of pancreatin have been tried.

The Physician's Visiting List, for 1877. Philadelphia: Lindsay & Blakiston.

This being the twenty-sixth year of its publication, is sufficient proof of its usefulness for the medical practitioner. As usual, it is published so as to be adapted for the records of from 25 to 100 patients a week.

Letters about the Exhibition. New York: Office of the *Tribune*. Large 8vo, pp. 72, double columns. Price, 25 cts.

This is a republication in pamphlet form of the letters written by the special correspondent of the *New York Tribune*, and originally published in that paper. They are written with good judgment and in an acceptable style.

OBITUARY.

TH. GOBLEY, a distinguished pharmacist of Paris, died recently at Luchon, and was buried in Paris. He entered as apprentice with Mr. Guérin, his brother-in-law, who had succeeded Robiquet, and after obtaining the title of *pharmacien* at the Paris school, commenced business, where he soon established a considerable reputation. In 1842 he became attached to the school of pharmacy as professor, and in 1868 he was made a member of the council of public hygiene, in both of which positions he labored assiduously. Many of his scientific investigations are of considerable importance, and have been noticed in full or in abstract also in this journal. The deceased repeatedly held offices of public trust, and was a member of the commission for the revision of the new Codex. Having been married to a daughter of Robiquet, he was happy in his family circle, where he enjoyed the fruits of a long and useful life.

HENRY ETIENNE ST. CLAIRE DEVILLE died suddenly on October 11th. The deceased was born on the island of St. Thomas in 1818, and was for many years professor of chemistry at the Collège de France at Paris, and a member of the French Academy of Sciences. He enjoyed a high reputation as a scientific investigator, and became widely known through his researches on the platinum metals, magnesium, aluminum, silicium, boron, the artificial production of crystallized minerals, etc. Many of his valuable contributions to science have been noticed in former volumes of this journal.

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